ENGINEERING NEWS-RECORD

FEB. 16, 1961

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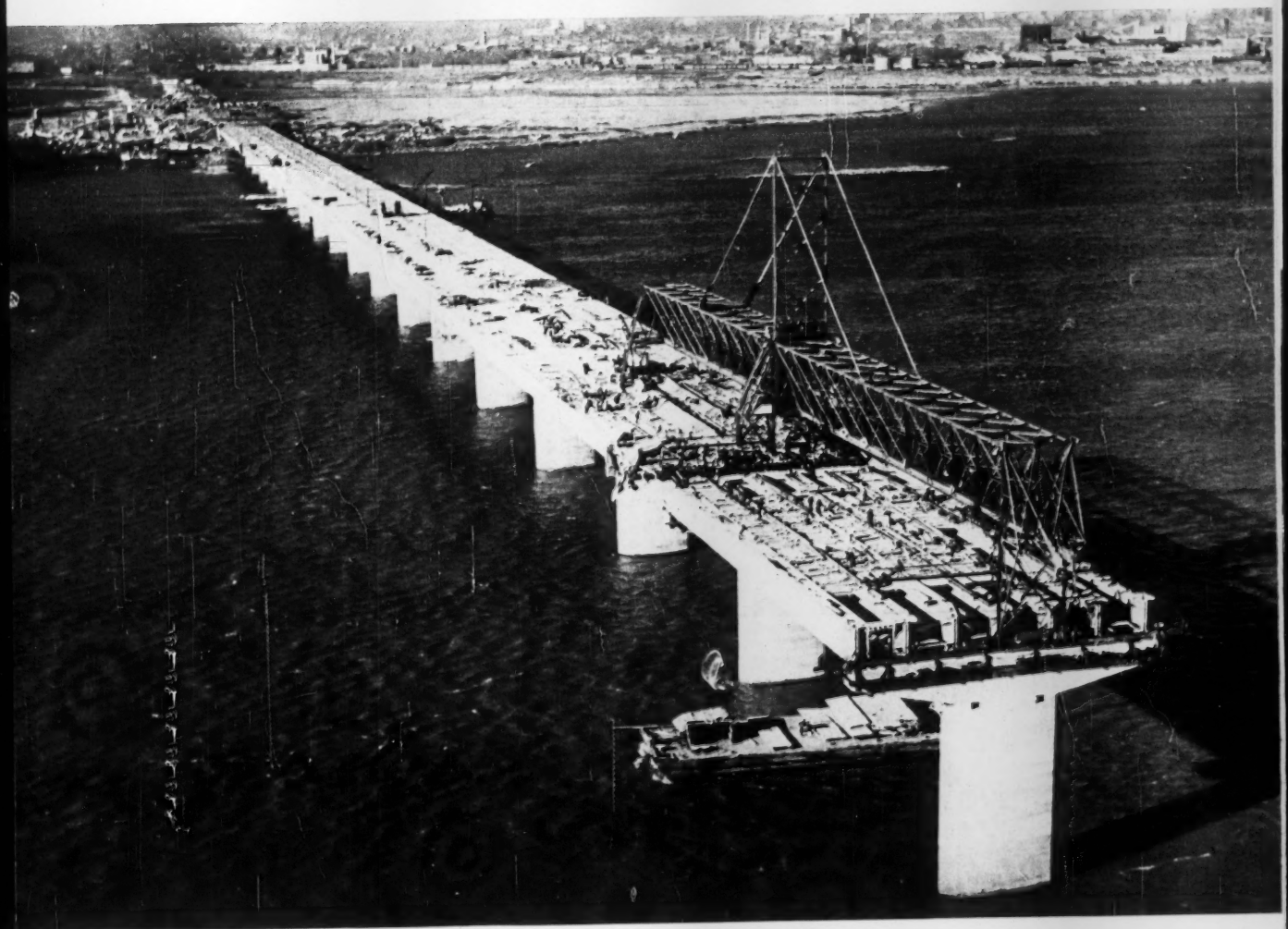
CONTENTS ON PAGE 17

Rochester rebuilds downtown p. 30

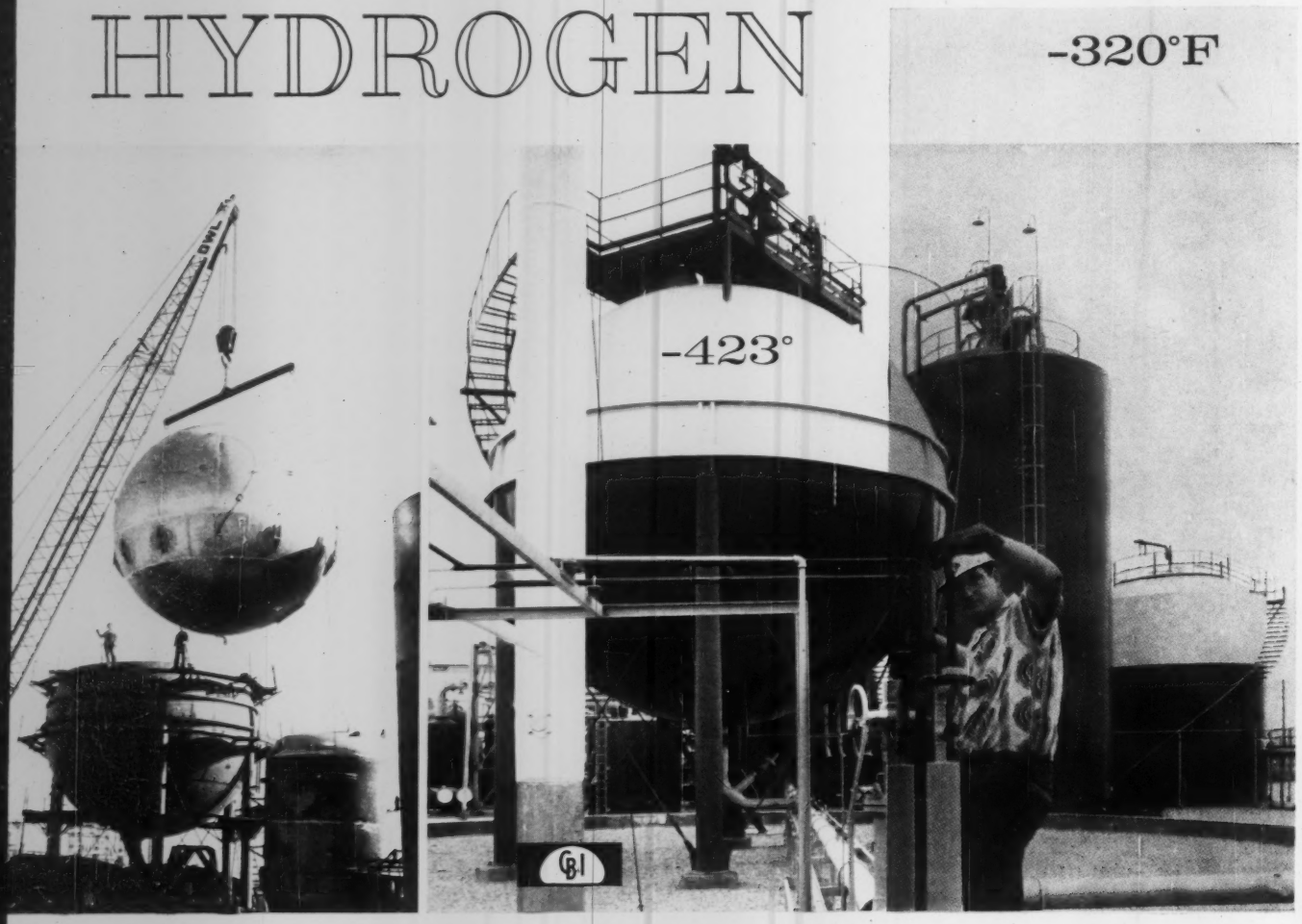


Giant steps span the St. Lawrence p. 44

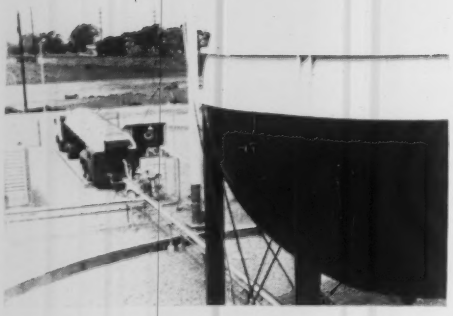
A McGRAW-HILL PUBLICATION

First privately owned and operated space-age plant
furnishes liquid hydrogen
to missile centers
and industrial users

NITROGEN
HYDROGEN



These double-wall cryogenic storage tanks play a vital role in the first privately-owned plant to supply liquid hydrogen on a large-scale commercial basis. Hydrogen is stored in the sphere at −423°F and nitrogen in the cylindrical tank at −320°F. Located in Torrance, Calif. and owned by Linde Company, Division of Union Carbide Corporation, the plant will deliver 3,300,000 lbs. of liquid hydrogen yearly to missile centers. Both tanks were designed (using Linde-approved designs), fabricated and erected by CB&I, world's most experienced builder of cryogenic vessels.



ABOVE: Aluminum inner shells and carbon steel outer shells were used for the two cryogenic tanks. The spherical tank is 28 ft. in diameter and the cylindrical tank 21½ ft. Special insulation is between the shells.

TOP LEFT: The inner sphere is suspended in the outer sphere by stainless steel rods positioned around the perimeter. Resting on the ground nearby is the aluminum inner shell of the cylindrical nitrogen tank.

LEFT: A trailer is being loaded with liquid hydrogen for delivery to missile centers, other government installations, or industry.

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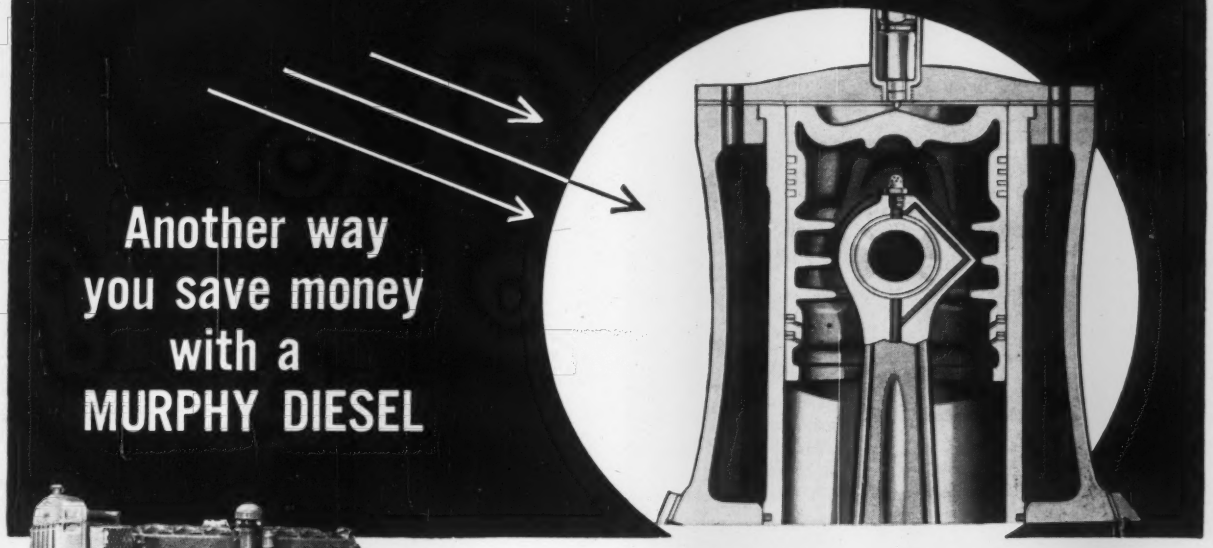
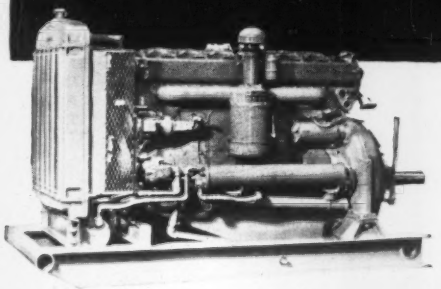
Another way you save money with a MURPHY DIESEL





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greater fuel economy
uninterrupted service
faster starting
smoother performance

If you want to get more power from every drop of fuel, smooth-running performance, and long service life, be sure you get a "true" diesel.

Murphy Diesel is a "true" diesel. The cross section above shows the combustion chamber. Note that it is plain and open. There is no pre-mixing chamber, no artificial device to create turbulence and affect combustion. In a Murphy, the unit fuel injector, located in the center of the combustion chamber, sprays completely atomized fuel directly into all parts of the air charge. Since all the fuel burns immediately upon injection into the incandescent air charge, combustion is controlled solely by the unit injector, which in turn is precisely controlled by the hydraulic servo-type governor.

Ask your Murphy Diesel Dealer for proof of Murphy's ability to save you money.

MORE MONEY-SAVING FEATURES

Unit Fuel Injectors serve as both pump and nozzle to provide precise control, faster response and greater fuel economy with minimum downtime, minimum attention.

Hydraulic Servo-Type Governor assures immediate response to load change and protects engine from damage if lube oil pressure drops below a safe level.

Four Valves Per Cylinder have greater breathing capacity for cooler running, and permit higher power output.

Murphy Diesel MP Series engines and power units, 105 to 320 HP; generator sets, 60 to 227 KW; dual fuel engines, 147 to 227 HP; marine engines, 105 to 315 HP.

MURPHY DIESEL ENGINE FEATURES MEAN MORE PROFITABLE OPERATION

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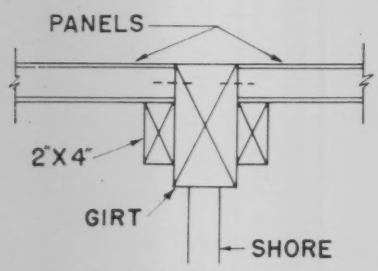

2 x 4's bolted to girt are removed, for ease of stripping.

When constructing apartments on the campus of Stanford University, Howard J. White, Inc. had one big problem . . . how to reduce slab-forming costs. Symons Steel-Ply Forms were the answer.

4 x 6 girts, laid longitudinally with the floor slab, are first set in place on shores and flush with the bottom of the slab. When the slab is poured, it bears directly on the timber girt. Next, 2 x 4's are bolted to the girt to form a ledge. Symons 4 ft. Steel-Ply Panels are dropped in place on the 2 x 4 ledge. No connecting hardware is used . . . carpenters drive a nail through a form-hardware opening to the girt on each panel so that when the 2 x 4 ledges are removed, the panels will not fall.

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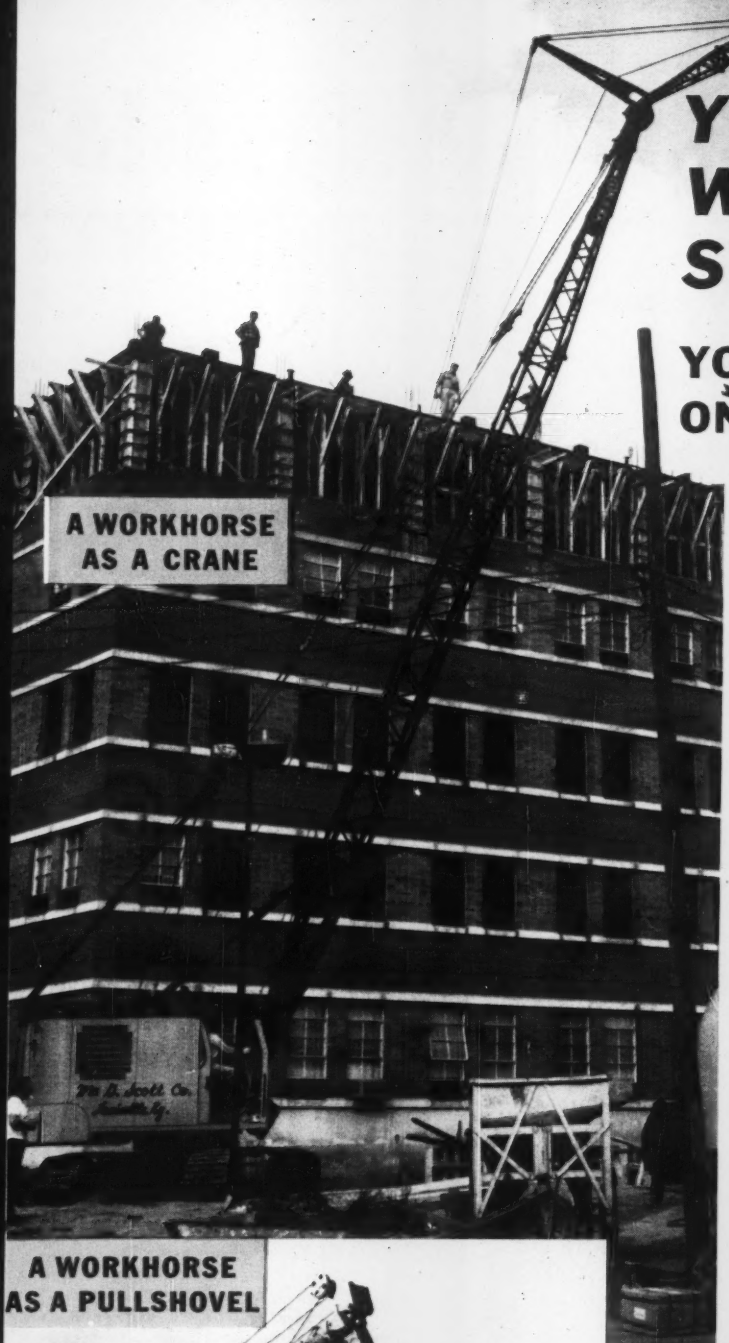
YOU CAN'T MAKE MONEY ON "DOWN TIME" . . .



GET acquainted with the 25-D the workhorse of the ¾ yd. field. Here is a real package of versatility and dependability. It brings you everything you need! As a crane there is nothing more versatile in the ¾ yd. class. Long, wide crawlers for stability! The improved Feather-Touch Clutch Control retains true "feel" of the load on the main drums. Northwest Uniform Pressure Swing Clutches run cool and smooth and eliminate jerks and grabs that set a boom to jumping.

Take a look at the Northwest Independent High Speed Worm Boom Hoist. It is built for heavy duty — power up and power down, independent of all other functions. There's a 3rd drum available for an extra load line and easier handling on pile driver work.

Many other advantages for crane work are available — sectional Boom Hoist rigging and Pendant Lines, Telescopic Boom Struts, Folding Gantries, Adjustable Jibs, Removable Counter Weight and a host of other features that assure greater value day-in and day-out on the job, whether it's working as a crane, dragline, pullshovel or shovel.

Here's a rig that will handle work that lighter machines of the same rated capacity can't handle. It will pay you to ask about it.

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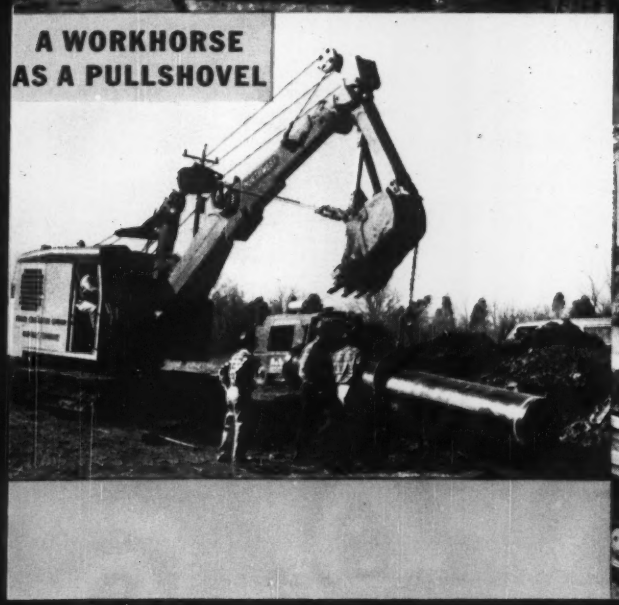


LUBE LOGIC Five ways to

Now's the time for battery check-ups

With cold weather ahead, your batteries will soon work harder than ever. Here's how you can help make sure they're up to it:

Inspection

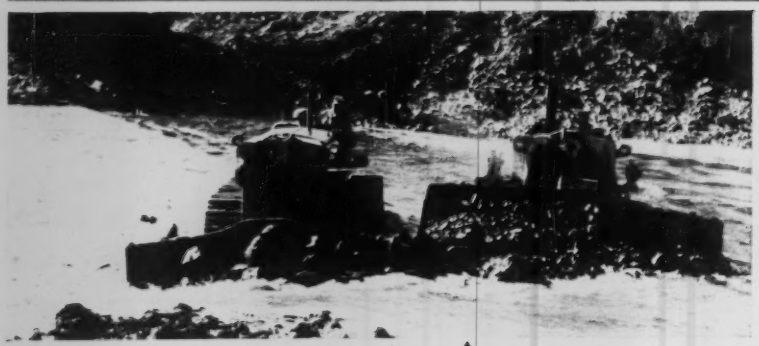
- Inspect battery case for cracks and leaks. See that vents in cell caps are open.
- Check battery posts and cable clamps for looseness, breakage or corrosion.
- Using distilled water, bring electrolyte in each cell up to level indicated in cell opening.

Hydrometer test for specific gravity

- Use a temperature-corrected hydrometer to test the state of battery charge. Make sure battery has not been recently fast-charged, nor water added.
- Draw enough fluid from each cell to raise float off the bottom of the hydrometer tube. Holding hydrometer straight up-and-down, take eye-level reading of the neck of the float. Repeat for each cell.
- Note the temperature, and correct hydrometer reading by subtracting 0.004 from the reading for each 10°F. below 80°F. (Example: If hydrometer reads 1.280, and temperature is 70°F., corrected reading would be 1.280 – 0.004 or 1.276.

Normal state of charge for 12-volt battery is 1.260 to 1.280 specific gravity. For a 6-volt battery, 1.265 to 1.290 specific gravity.

LEADING CONTRACTORS—EVERYWHERE—RELY ON TEXACO LUBRICATION

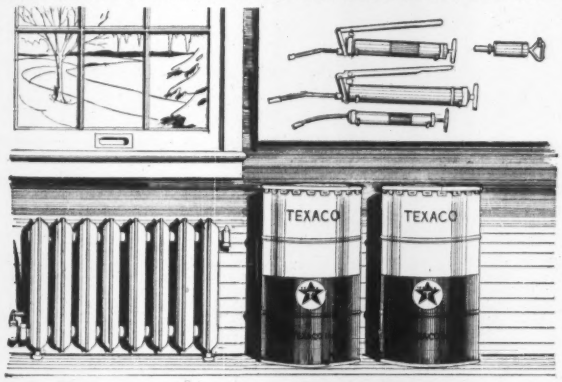


▲ **Isbell Construction Company** bulldozers remove reefs from river channel on Truckee River Flood Control project near Sparks, Nev. Isbell heartily endorses Texaco's Simplified Lubrication Plan.

◀ **Interstate Highway 80 Project** at Colfax, Iowa. Texaco Engineer E. A. Rolwes (right) works closely with Mott Construction Company on the important assignment of keeping equipment on the job and maintenance costs low.

▲ **Ledbetter-Johnson** gouges out largest rock cut (306 ft.) east of Rockies in highway project near Dalton, Ga. This company uses Texaco lubricants to keep their equipment on the job . . . their costs down.

ease winter maintenance



Grease guns like it warm

Store grease guns this way, properly racked to avoid damage, and they'll give you much better service. Incidentally, lubricants like to be stored warm, too.

Warm up the guns if they're too cold to pump the lubricant. Best way is to bring them into a warm place far enough in advance of use. Don't ever attempt to warm them up by direct application of heat.

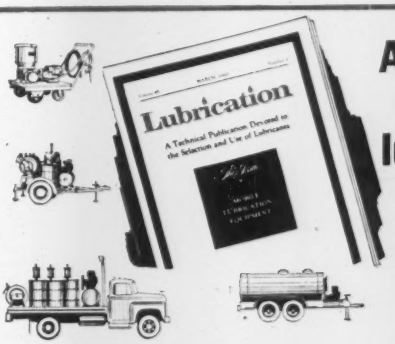
Save the engine— not the anti-freeze

Go slow on using last year's anti-freeze. Although it might still give good protection against freezing, chances are those chemical additives that protect the cooling systems of your engines against rust and corrosion have lost their punch. Your best bet, after draining and thoroughly flushing the radiators, is to fill them up with fresh new anti-freeze — such as Texaco P-T Anti-Freeze.

"Easy does it"... after an oil change

When an engine's crankcase is drained — so is the oil pump's intake sump and pipe. And when the engine starts up, the oil pump must first suck up a lot of air before it starts chewing oil.

To avoid possible damage to the engine, idle it first at low speed. The oil pressure should begin picking up in a matter of seconds and reach normal readings within several minutes. Wait until it does — before you start working the engine.



All about mobile lube rigs

- How to make good lube rigs
- How to use lube records to make rigs more valuable
- Special purpose lube rigs
- Pros and cons of mobile and centralized lubrication

These are just a few of the facts about mobile lube rigs you'll find discussed in the March 1960 issue of Texaco's *Lubrication* magazine. We've devoted the whole issue to it —and we'll send you a copy *free*. Write today to Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. NR-23.

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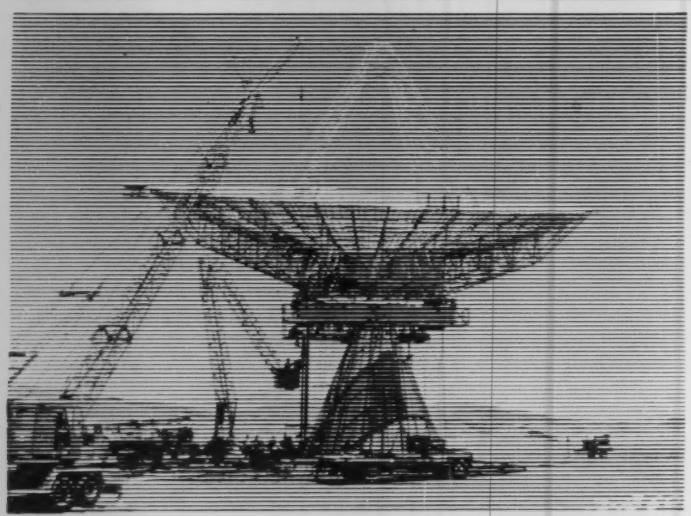

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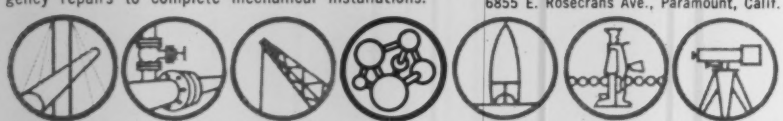

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Reader Comment

U. S. Prestress Pioneers

SIR—References to the Sunshine Skyway in the letter in ENR Nov. 3, 1960, p. 10, were incorrect on some important points. Also, the writer omitted mention of the consultants for this Lower Tampa Bay Bridge—Parsons, Brinckerhoff, Hall & Macdonald (now Parsons, Brinckerhoff, Quade & Douglas) of New York.

Several prestressed concrete designs were considered, but the one prepared by my firm was accepted by the consultants and Mr. Dean. It was the longest prestressed structure in the world at that date.

Mr. Schupack is correct in suggesting the Preload organization deserves specific acknowledgment, and it was Curzon Dobell, then its president, who was the moving spirit leading to prestressed concrete being used for the Sunshine Skyway, as well as spreading U. S. experience in circular prestressing to other parts of the world.

We had previous experience that made it easy to accept responsibility for the prestressed design, but the consultants had to be satisfied the design could and would be carried out sucessfully; also, Mr. Dean had to accept responsibility for what then appeared a breakaway from previous Florida practice. However, as many know, he has since been responsible for a number of similar prestressed structures, of which the Gandy Bridge, Palma Sola Crossing and Manatee River Bridge are examples; these are prestressed with high tensile bars.

DONOVAN H. LEE
Consulting Engineer
London, England

Not In On Repairs

SIR—We note a statement (ENR Jan. 19, p. 23) that a contract for repairs to the tower legs of the Texas Tower No. 4 was awarded to a combine of J. Rich Steers and Morrison-Knudsen. While your statements are correct regarding our company having a part in the original construction of this tower, we were not involved in the contract for repairs which were being done by J. Rich Steers.

LYMAN D. WILBUR
Vice President
Morrison-Knudsen Co., Inc.
Boise, Idaho

(Reader Comment continues p. 10)

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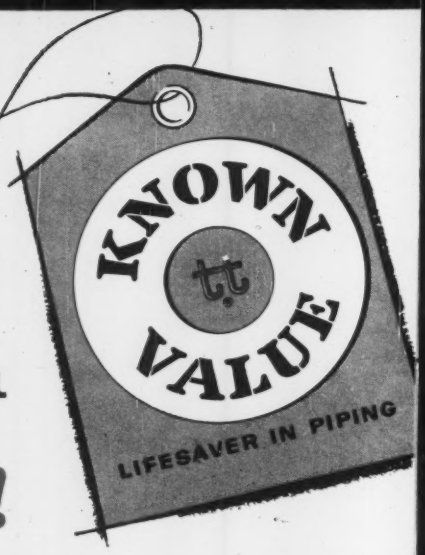

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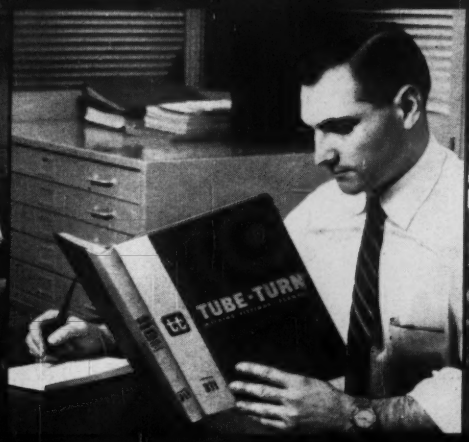

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Tube Turns offers not only the most complete line of properly engineered welding fittings and flanges for utmost flexibility in planning any piping installation, but a wealth of technical data and able engineering assistance without counterpart anywhere in the world. Standardizing on TUBE-TURN piping components saves time and trouble.

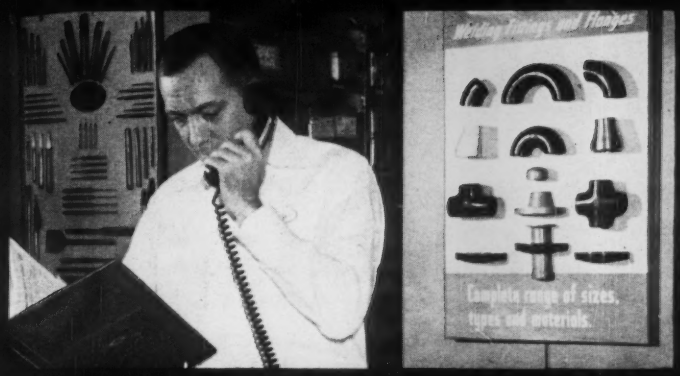
LIFESAVER For The Men Who Buy Piping

The world's most complete line of welding fittings and flanges, over 12,000 regularly stocked TUBE-TURN items, permits every specification to be met without compromise or delay. A fully responsible Tube Turns Distributor is as near as your telephone to give prompt delivery of *all* your needs from *one* source on a *single* order. Saves time, paperwork, multiple checking, piecemeal deliveries and the inevitable problems of divided responsibility. You *save* money when you standardize on TUBE-TURN piping components!

LIFESAVER For The Men Who Install Piping

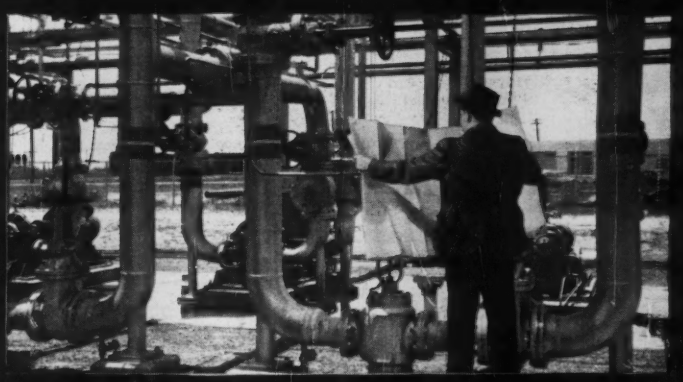
Time is money in the assembly of a welding piping system. TUBE-TURN welding fittings and flanges do not require remanufacture or compromises . . . or the delays that result from rejections. They are uniform, precision-engineered for easy, time-saving installation. And you can put them in and *forget* them because they *are* dependable. TUBE-TURN piping components cost less because they save more in every way!

TUBE-TURN Welding Fittings And Flanges Are Stocked By And Sold Exclusively Through Authorized Distributors.



More service with less paperwork

More savings getting pipe installed



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Water Stops. For horizontal or vertical construction joints, especially under extreme conditions of separation. Variety of widths.

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Water Stops. For expansion joints where shearing stress is anticipated. Three rib style most popularly used.

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. . . Reader Comment

Explosive Fertilizer

SIR—Regarding the use of ammonium nitrate fertilizer as an explosive (ENR Nov. 24, 1960, p. 44 and Jan. 12, 1961, p. 6), we were called on shortly after a 1959 explosion that leveled a five-block-square area in Roseburg, Ore., costing thirteen lives and almost $10 million in property damage.

Our interest was on behalf of the underwriters, but we also assisted the city in condemning certain unsafe buildings and worked with the city engineer, Ken Meng, in an effort to determine which structures were safe enough to permit workmen to enter for restoration purposes, and which would have to be condemned as being unsafe to enter.

The explosion was caused by a fire in a building supply house. It set off two and one half tons of dynamite and four tons of ammonium nitrate in a nearby truck. From discussion with authorities familiar with the effect of explosives, who were on hand and who viewed the explosives, I can state that the ammonium nitrate contributed substantially to the magnitude of the explosion.

The fertilizer grade is in common use in Oregon in road construction, logging and agriculture. Mixed with fuel oil, it is detonated by blasting caps and occasionally by detonating fuse.

This material is a powerful explosive. It should be handled and treated as such, and the laws governing its handling should be the same laws applicable to other commercial explosives.

ARTHUR M. JAMES
Consulting Engineer
Portland, Ore.

Panero on Saigon Job

SIR—In the article on engineering work in Southeast Asia (ENR Jan. 19, p. 30) it should have been stated that Guy B. Panero, engineer of New York, was associated with our firm in the review of the alternate water supply schemes for the city of Saigon.

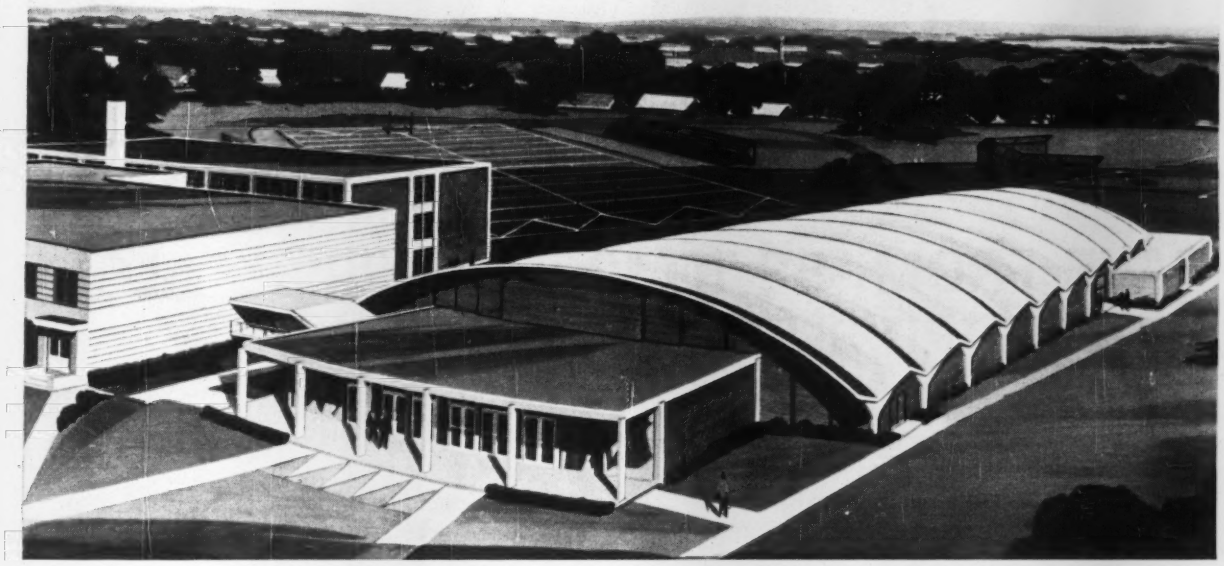
RICHARD HAZEN
Hazen & Sawyer
New York, N. Y.

Only a Branch

ENR erroneously reported that Robert V. Lord had bought the facilities of Western Laboratories, Inc., in Lincoln, Neb. (ENR Jan. 12, p. 49). What Mr. Lord bought was the facilities of Western Laboratories' Boulder Branch office, which serves the Rocky Mountain area. The sale did not affect the Lincoln office of Western Laboratories, Inc., which still does consultation work in soils and flexible pavement design.

The Frayser High School Auditorium, Memphis, Tennessee

Architect: Dean E. Hill & Associates, Memphis
General Contractor: McNeese Construction Company, Memphis
Specification Engineer: S.S. Kenworthy & Associates, Memphis



8 reasons why no other insulation fits your roof deck needs as efficiently and economically as ZONOLITE® VERMICULITE CONCRETE

The curved folded plate roof of the new Frayser High School auditorium is insulated with Zonolite Vermiculite Concrete . . . chosen for the job because of its unmatched adaptability and because it offers more advantages than any other roof insulation:

1 **LIGHT WEIGHT** . . . as little as 1/6th the weight of ordinary concrete, so supporting structures can be considerably lighter in weight and cost.

2 **ANY DESIRED INSULATION VALUE** can be obtained by simply varying the thickness of Zonolite Vermiculite Concrete.

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4 **MONOLITHIC** . . . continuous surface; no seams to allow tar drip in the event of fire.

5 **INCOMBUSTIBLE** . . . Vermiculite Concrete is all mineral, cannot possibly burn.

6 **FLEXIBILITY** . . . can be used with form boards, paper-backed wire lath, galvanized metal decks or structural concrete. Adapts easily to conform to any drainage or slope problem.

7 **ECONOMICAL** . . . original cost is low, maintenance costs are nil. Insulation efficiency may even allow use of smaller heating and cooling units.

8 **FAST APPLICATION** . . . all Zonolite Applicators are specialists, especially trained to give you a fast, high quality job.

Other roof deck systems may offer three, four or five of the above advantages, but Zonolite Vermiculite Concrete is the only one that offers all eight. For complete specifications and data file, have your secretary mail the coupon below.

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Save on construction costs with the new '61 FORD TRUCKS

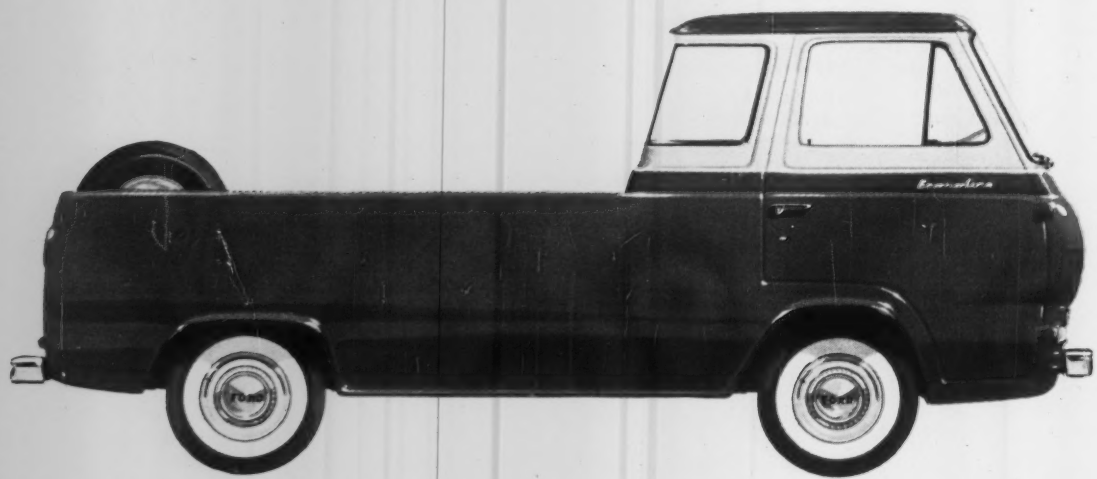
SAVE FROM $52 TO $221 ON PRICE* ALONE WITH FORD'S ECONOLINE PICKUP

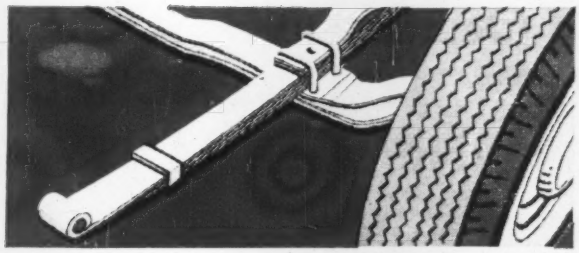
Profit-conscious contractors are finding it's good business to do business with the new Ford Econoline Pickup. It's America's lowest-priced* pickup—bar none! Priced from $52 to $221 below other cab-forward economy pickups. But that's just the beginning! You get lively performance and proven gas economy with the popular Falcon Six. This modern engine goes 4,000 miles between oil changes, and has an aluminized muffler which lasts up to three times as long as ordinary mufflers.

And you can save more because Ford's functional design has pared away 1,000 pounds of dead weight, yet you still get the payload capacity of standard ½-tonners. The big 7-foot box provides a whopping 73 cubic feet of loadspace . . . that's up to 23% more than conventional 6½-foot pickups. A full 49-inch tailgate opening means you can load items like standard sheets of 4′ by 8′ plywood. And the full-length *flat* floor permits bulky or heavy loads to be positioned easily by sliding them anywhere in the pickup box.

And you can save on maintenance expense, too. The engine cover can be lifted quickly, exposing the entire engine for rapid service. Spark plugs, distributor, etc., are conveniently located to speed engine tune-ups. And many major repairs can be made without ever removing the engine. One-piece cab-and-body construction provides increased rigidity and eliminates a major source of rust. In addition, all main underbody structural members are heavily zinc-coated to resist rust and corrosion.

**Based on a comparison of latest available manufacturers' suggested retail delivered prices*





SAVE UP TO $150 ON FRONT TIRES! In certified tests of truck suspensions, Ford front tires lasted up to twice as long. In 50,000 miles savings can add up to $150 on a pickup . . . more on two-tonners. And Ford's sturdy I-Beam front axle and leaf-spring suspension not only cut tire wear, but their simpler design also cuts maintenance costs.

12,000 MILE OR 12 MONTH WARRANTY

SAVE WITH GREATER DURABILITY . . . on all 1961 Ford Trucks, each part, except tires and tubes, is now warranted by your dealer against defects in material and workmanship for 12 months or 12,000 miles, whichever occurs first. The warranty does not apply, of course, to normal maintenance service and to the replacement in normal maintenance of parts such as filters, spark plugs and ignition points. Never before have you had such protection . . . such evidence of long-term economy!

SAVE WITH FORD'S NEW 262-CU. IN. "BIG SIX" ALL-TRUCK ENGINE FOR TOP PERFORMANCE AND ECONOMY

America's lowest-priced* medium-duty tilt-cab models now offer a big 262-cubic-inch Six with the power of big displacement, the gas economy of 6-cylinder design, plus the durability of heavy-duty construction. This engine features a sturdy stress-relieved head and block, strong forged steel crankshaft, long-lasting stellite-faced intake and exhaust valves and durable pyramid-type connecting rods. Positive Crankcase Ventilation reduces oil dilution and sludge formation to extend engine life. Ford's proven 292 V-8 and 292 HD V-8—the V-8's with "six-like" economy—are also available for your special power needs.

The popular Ford Tilt Cab Series outsells all other makes and for good reason! Their compact 82-inch BBC permits longer bodies within a given over-all length . . . for longer loads of lumber and building materials with excellent maneuverability. And set-back front axle design means more weight is carried on the front axle for greater payloads.

You also save with other new features like the stronger radiator with new lock-seam construction, and color-coded printed instrument panel electrical circuits that provide for greater reliability and simplified maintenance. In addition, Ford's parallel ladder-type frame, with standard 34-inch width, allows you to install new or transfer your present special construction bodies quicker and for less.

NEWS OF MORE SAVINGS FOR HEAVY CONSTRUCTION WORK . . . ▶

Save on construction costs with the new '61 FORD TRUCKS

NEW SUPER DUTIES CUT OPERATING COSTS, GIVE PROVEN DURABILITY THAT'S BACKED BY A 100,000 MILE ENGINE WARRANTY

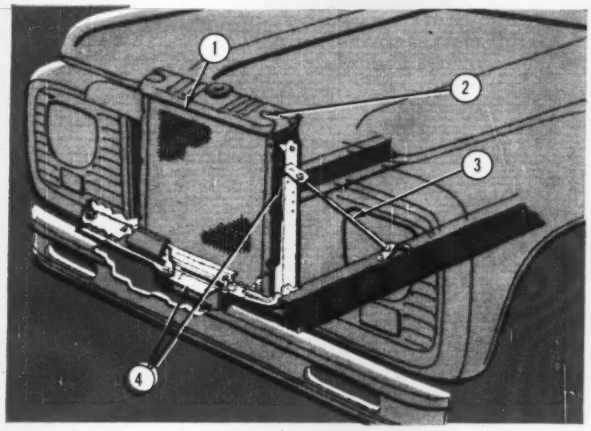
New 100,000-mile warranty on Super Duty V-8 gas engines is the most liberal in the industry. On 401-, 477- and 534-cu. in. V-8's, Ford Dealers will replace any major engine part (including block, heads, crankshaft, bearings, valves, pistons, rings) found to be defective in materials and workmanship providing trucks are used in normal service. The warranty covers full cost of replacement parts for 100,000 miles or 24 months, whichever occurs first . . . full labor costs for first year or 50,000 miles, sliding percentage scale thereafter. Never before have you had such protection . . . such evidence of long-term durability!

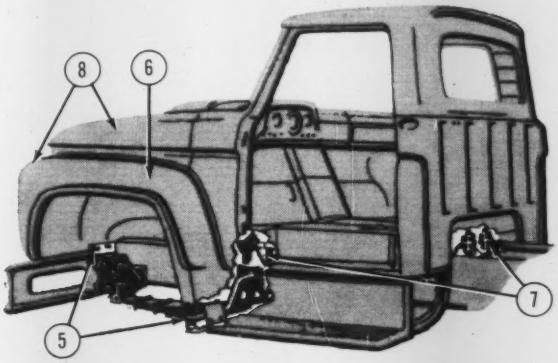
And you save with greater gas economy! Certified tests prove the new Super Duty V-8's give up to 20% better mileage. In addition, Ford's new lightweight, *extra-hi-tensile* single-channel frames (standard F-850—F-1000) give you long-lived durability combined with a lightness of weight for added payloads. All in all, you get proven components and design features . . . in trucks built for easier maintenance and lower running costs.

Save with Ford T-Series Super Duty Tandems for exceptional durability, big payloads and low operating expenses. Ford T-850 and T-950 Tandems with Super Duty V-8 engines have rugged double-channel, hi-tensile frames for maximum strength, minimum weight. And they provide a wider range of chassis options so you can choose the right power train and load-carrying components for any job. Eaton and Timken rear axles are now available in bogie assemblies with up to 38,000-lb. capacity. And lightweight aluminum walking beams, wheels and gas tanks are available to keep chassis weights low . . . payloads high.

Ask your dealer about Ford's full tandem line . . . five T-Series with GVW's ranging from 28,000 lb. to 51,000 lb. and GCW's up to 75,000 lb.

SAVE WITH NEW HEAVY-DUTY CONSTRUCTION THAT DOUBLES CAB, SHEET METAL AND RADIATOR LIFE





① **Save with Ford's exclusive "lock-seam" radiator construction** that doubles the solder area at key seams for greatly increased strength and longer radiator life.

② **Save with heavier-gauge metal on radiator tank and header.** Tanks and header have thicker walls to resist vibration, jolts and corrosion for greater reliability.

③ **Save with independent radiator mountings,** separate from front-end sheet metal. This means that road shocks and shakes are not transmitted to the radiator through sheet metal . . . tanks, tubes and connections last longer, require less maintenance.

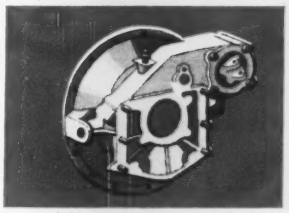
④ **Save with "horse collar" mounting** for extended radiator life. This new mounting on resilient rubber at the center of frame cross member soaks up any frame flexing . . . cuts wear and tear on entire cooling system.

⑤ **Save with independent fender mountings.** Fenders are bolted to a rubber-cushioned transverse bracket at the front and a frame-mounted bracket at the rear. This mounting, independent of both cab and radiator, eliminates stress transfers for increased fender life.

⑥ **Save with removable fenders.** The quick and easy removal of only 8 bolts per fender provides faster service accessibility to the engine area, saving valuable maintenance time.

⑦ **Save with new 3-point cab mounting system** for greater cab durability. Two outboard front mounts plus a centered "twin" rear mount provide a triangular system that holds the cab stationary while allowing the frame to move independently . . . reducing strain on the cab.

⑧ **Save with 42% heavier-gauge sheet metal** in fenders, hood, cab floor pan and toeboard for greater strength, greater durability.



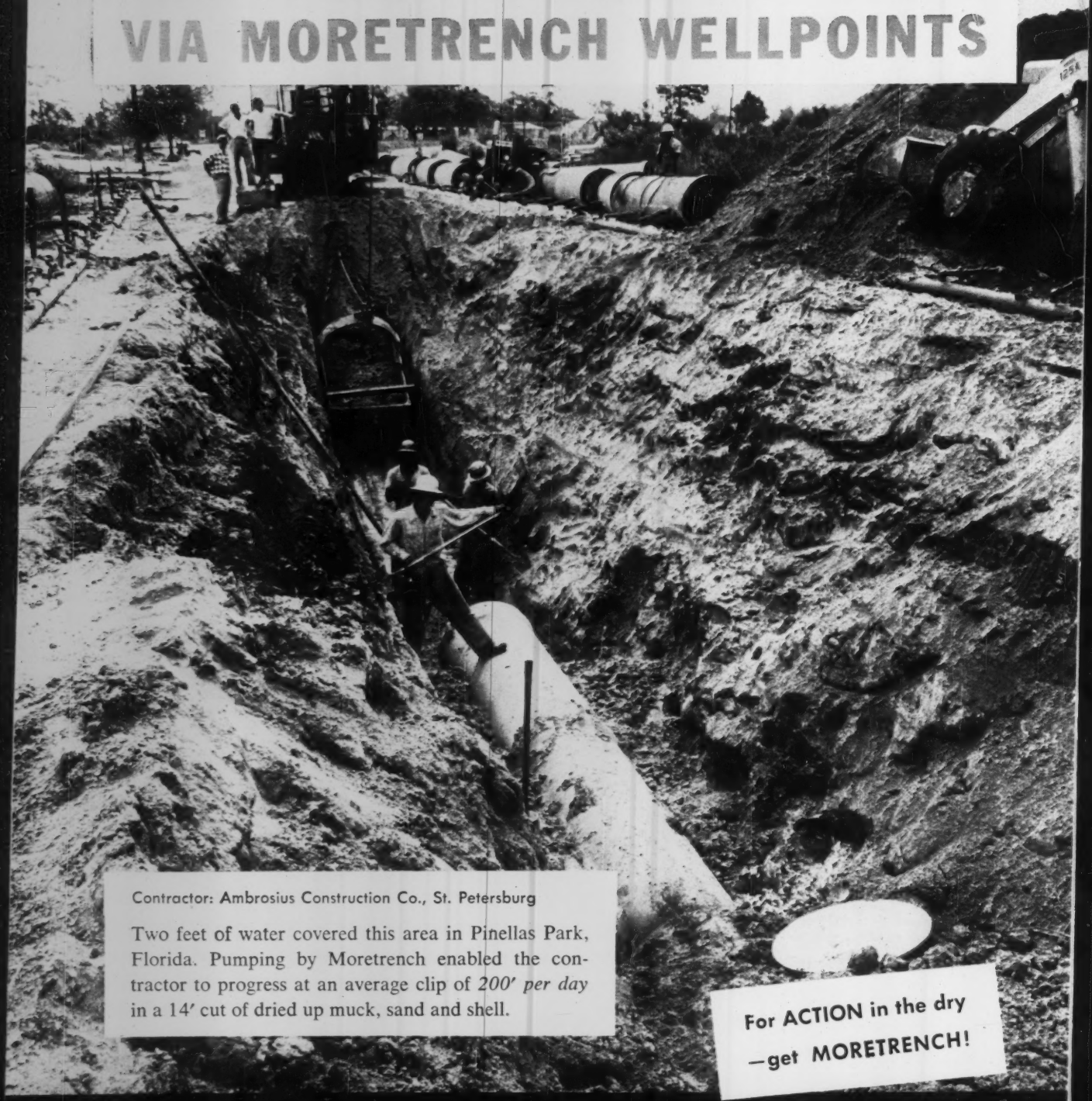
Save with Ford's new Full-Torque flywheel power take-off . . . now available on T-750's and up, to power construction equipment like transit mixers. It's much simpler and more efficient than long, complicated hookups needed with the front-end drives. And the flywheel PTO is lighter in weight—only 105 pounds—for greater payloads.

FORD TRUCKS COST LESS

YOUR FORD DEALER'S "CERTIFIED ECONOMY BOOK" PROVES IT FOR SURE...

FORD DIVISION, *Ford Motor Company*

WET SWAMP BECOMES DRY SEWER
VIA MORETRENCH WELLPOINTS



Contractor: Ambrosius Construction Co., St. Petersburg

Two feet of water covered this area in Pinellas Park, Florida. Pumping by Moretrench enabled the contractor to progress at an average clip of *200′ per day* in a 14′ cut of dried up muck, sand and shell.

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ENGINEERING NEWS-RECORD

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CONTENTS

Payoff Begins at Niagara Falls 21
Engineer Salaries Growing 5% a Year 23
Blatnik Wants Separate Pollution Agency 23
AED Worried Over Prospects for '61 24
GSA Head Favors Modern Design 24
Weaver Confirmed as Housing Administrator ... 25
Glass Tower Finishes Hartford Project 25
Construction Hypo in the Health Plan 26
Shell Roof Supports Observation Platform 26
Snow Melting Schemes Too Hot to Handle 28
Pennsylvania Increases Gas Tax 28

FEATURES

Rochester Brings Them Back From the Suburbs .. 30
'Design and Construct' Spans the St. Lawrence .. 44
Builders Battle Elements to Finish Atlas Base ... 52

INTERNATIONAL

French Housing: Vive la Difference 58
London TV Studio Split by 80-Ft Doors 58
Unknown Bridge Took Know-How 60

FIELD AND OFFICE

How to Figure Steel Weight in Bridges 64

RESEARCH AND DEVELOPMENT

How to Reduce Ceiling Cracks 69
Traffic Pacer Matches Speed Signs With Lights .. 69

NEW PRODUCTS

Trencher Digs Deep and Wide 71
Trencher Comes With Three Booms 71
Trickling Filter in a Package 72
Radiation Gages Sludge Density 72

MEN AND JOBS

Pereira vs Luckman: A Study in Contracts 78
Raymond Award Goes to E. J. Klohn of Canada . 85

BUSINESS AND FINANCE

Financial-Legal Troubles Follow Land Slip 112
Law Book Hits Electrical Firms 113
FTC Shoots at Materials Maker 113

LABOR

Wage Bill Touches Construction Labor 117
Union Pay Scales Average $3.70 118
Rock and Tunnel Workers Lose Bargaining Bid .. 120
Former Chicago Lawyer Named NLRB Chairman . 120

Reader Comment ... 6
Washington Observer 19
Books 89
Unit Prices 97
Materials Prices 98
Construction Reports 99
Statistics, Indexes .. 111
Editorials 132

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THE CONSTRUCTION WEEK

NO STRIKES, MAYBE—Watch for the AFL-CIO building trades unions to make a gesture this week to ease the threat of strikes at missile base sites. This will not come in the form of a "no-strike" pledge, such as existed during World War II. More likely is a declaration recognizing the importance of the base jobs to national security and expressing labor's intent to resolve jurisdictional disputes without strikes.

ONCE BURNED, TWICE SHY—Look for a Corps of Engineers announcement late this month of a negotiated contract for construction of the first Minuteman ICBM base, at Great Falls, Mont. The Corps' Ballistic Missile Construction Office is taking no chance on a repetition of the awkwardness that grew out of the first bidding on the job. The $78-million low bid had to be rejected because it was more than 50% over the Corps' estimate. CEBMCO accepted new bids last week, but didn't open them publicly.

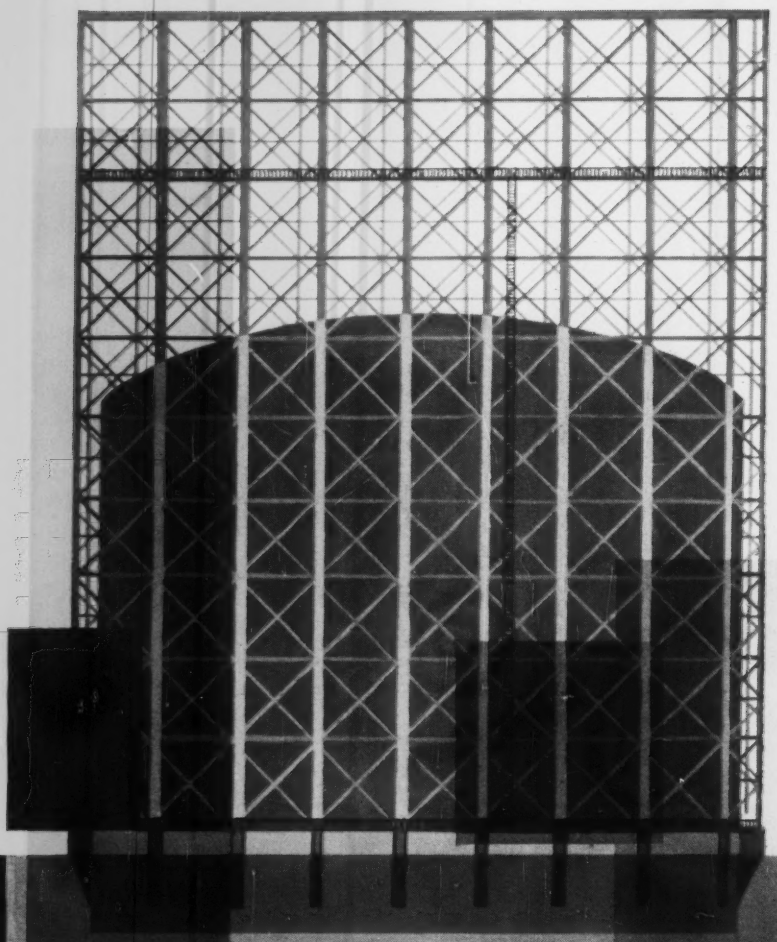
BRIDGE BONANZA—States lying along the Mississippi upstream from the mouth of the Illinois River stand to save some $7.3 million in construction of 23 bridges as a result of a new Corps of Engineers ruling on clearance requirements. New bridges must provide navigational clearance of not less than 45 ft above river level exceeded only 2% of the time. This is a reduction of 10 ft.

A BIG ONE—Capital investment in General Motors' car-manufacturing and assembly complex planned for construction this year in Fremont, Calif. (ENR Jan. 26, p. 32) is unofficially estimated at $100 million.

CHANGING OF THE GUARD—The new Republican majority of New Mexico's Highway Commission has fired two top highway department employees, demoted another and canceled $550,000 worth of consulting engineer contracts awarded by the previous commission on Dec. 29, 1960. Removed are Horry Payne, administrative engineer, and Fred M. Standley, chief of the legal section. D. B. Dixon, chief highway engineer, will go to another post within the department.

NAVY PROJECT DOWN UNDER—The Navy may spend over $100 million for an ultra-low-frequency radio station located somewhere in the desert of western Australia. The station would maintain radio contact with submerged atomic subs cruising the Pacific.

NORTHEAST FLOOD BUILDUP—Snowpack data collected by the U.S. Weather Bureau show an unusual buildup in the northeastern states, approaching in some areas the proportions that resulted in disastrous floods in 1936. Alternate freeze and thaw periods will dissipate the water. But head for high ground if moderate temperatures and heavy rains occur at the same time.



WITH EVERY COAT
WITH EVERY COAT
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WITH EVERY COAT

LOOK AHEAD WITH LEAD

Added Protection

Added protection is derived from incorporating lead in **every coat** of paint . . . from primer to finish coat.

For primers on structural steel, red lead paint has long been recognized as standard. Research has maintained this position by developing formulations with a variety of modern vehicles to meet every requirement of cost, drying time, surface condition and type of exposure.

But there are a number of lead pigments at the command of the engineer in his fight against corrosion. By taking best advantage of them all you get maximum protection at lowest cost—regardless of painting and exposure conditions.

In addition to time-proved anticorrosive primers like red lead and lead chromate and well tested surface coats with great durability when exposed to the weather like white lead and international orange, research has developed such pigments as the basic lead silico-chromate with interesting properties worth investigating.

Remember: Now you can get extra protection against corrosion by using the properly formulated lead pigmented paint **every coat** of the way. For information contact the Lead Industries Association, 292 Madison Avenue, New York 17, New York.

WASHINGTON OBSERVER

- Aid for school building safe
- Easier forms coming
- More personnel notes

- **Congress probably will trim President Kennedy's whopping school aid request down to a straight construction measure.** He asked Congress to let the states use federal funds either for construction or teachers' salaries. But the House is likely to knock out the salary provision, as it did last year.

  Mr. Kennedy's proposal calls for five years of outlays starting at $660 million in the first year and rising to $1.6 billion in the fourth and fifth years. Last year, the Senate approved $900 million a year for two years. The smaller starting sum recommended by Mr. Kennedy is a gesture to keep the fiscal 1962 budget deficit as low as possible.

  The Administration plan also would allocate extra funds to low-income states, mostly in the South, and to cities with more than 300,000 inhabitants. Aid to higher education would include grants and loans for construction averaging about $900 million a year.

  The threat of an anti-discrimination amendment has been removed. Rep. Adam Clayton Powell (R., N. Y.) says he believes Mr. Kennedy can and will achieve school integration by executive order. Representative Powell will not insist on an anti-discrimination rider on the school aid bill, nor on any housing legislation. Such riders have proved stumbling blocks in the past.

—

- **Two congressional committees are looking into the lag in ICBM base construction.** A House appropriations subcommittee, under **Rep.** Harry R. Sheppard (D., Calif.), is digging into the question of rising construction costs. This is the major issue in the delay in awarding the first Minuteman site contract.

  Jurisdictional labor disputes will come under close scrutiny by the Senate government operations investigation subcommittee, headed by Sen. John L. McClellan (D., Ark.). The subcommittee staff already is checking into the subject, preparatory to public hearings in the near future.

—

- **New contract forms for federal construction projects will be put into use by the General Services Administration July 1.** All government agencies, including the military, will use the new forms as part of a continuing GSA effort to make it easier to do business with the government.

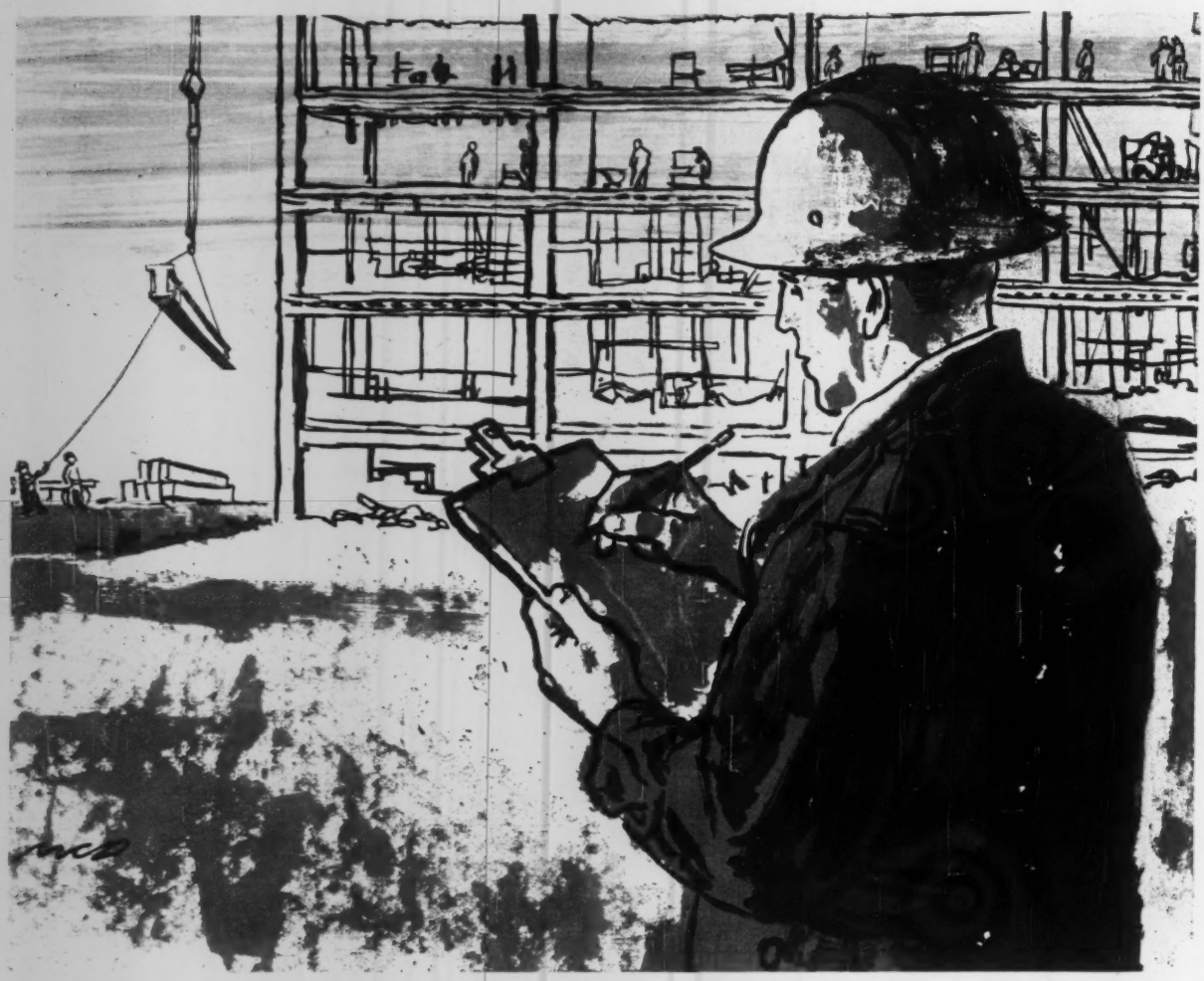
  The forms reflect changes in laws and regulations since 1953, the year those currently in use were published. The Associated General Contractors cooperated with GSA in developing the new forms, which are for use in obtaining bids and in contracting for construction, alteration and repair of buildings, bridges, dams, roads and other federal projects.

—

- **New Administrator of the Rural Electrification Administration is Norman Clapp,** a Wisconsin weekly newspaper editor and brother of former TVA chairman Gordon Clapp. Named a member of the TVA board of directors was A. J. Wagner, formerly TVA general manager. He succeeds Brooks Hays, who becomes Assistant Secretary of State.

PROTECTION IN DEPTH

How it helps cut compensation costs



Every hazard he spots can save you money

Contractors who insure with Liberty Mutual value the aid of a Liberty loss prevention engineer. His practiced eye sees hazards that others might miss. He learns your operation, understands your job plans and problems. Briefed in advance, he can help you reduce accidents and losses, keep your compensation costs down and improve worker efficiency.

Safety engineering is but one of the many Liberty Mutual services that add up to protection in depth. This broad concept of loss control not only prevents accidents, but also helps lessen the impact of injuries that do occur. For example, Liberty's protection in depth also includes 24-hour claims service, two rehabilitation centers, a special paraplegic ward, and the availability of leading orthopedic specialists in 78 cities.

Protection in depth helped save Liberty Mutual workmen's compensation policyholders many millions of dollars last year. To find out how Liberty's protection in depth can help lower *your* costs, just call the nearest Liberty Mutual office.

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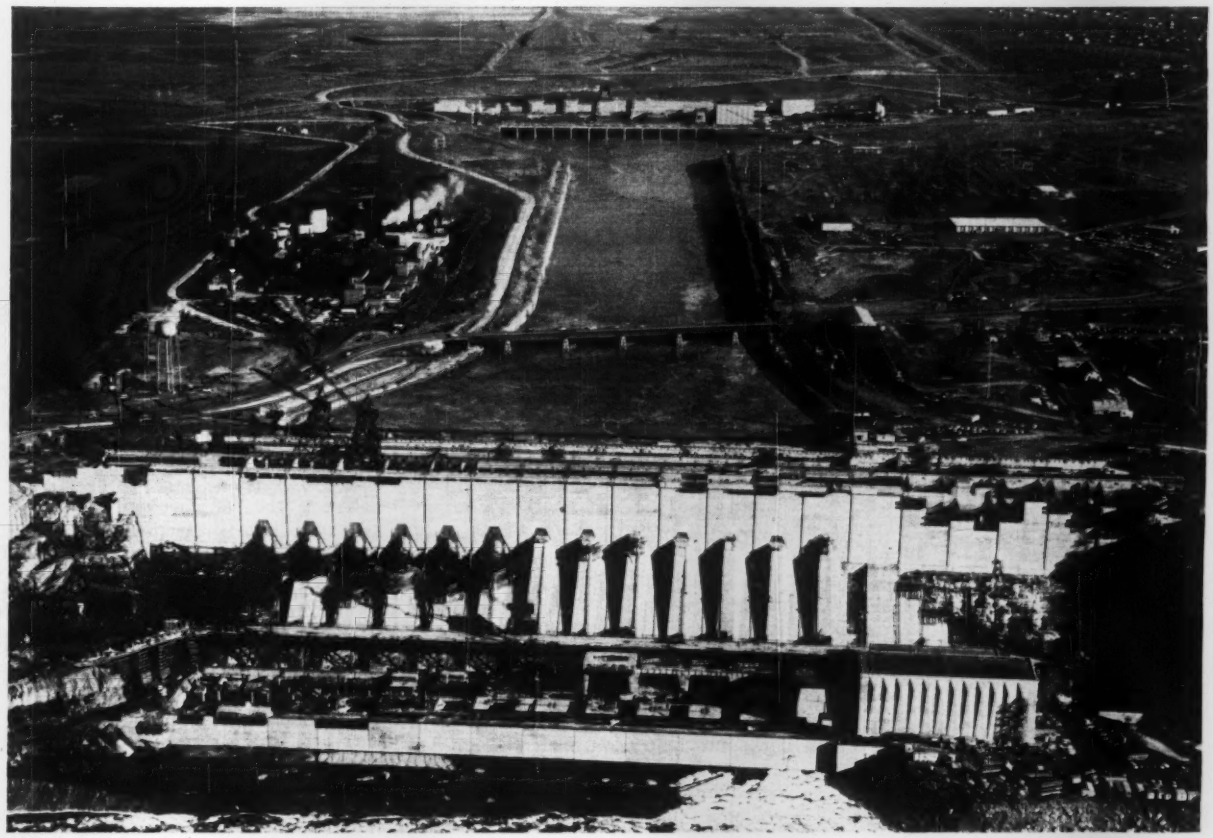


Robert Moses Plant (foreground) and Reservoir Plant (rear) tap U.S. share of Niagara power.

Payoff Begins at Niagara Falls

A countdown under way for 1,107 days came to a dramatic end last Thursday when first power flowed at the Niagara Power Project. The initial 150,000 kw from the Western World's biggest power project was "on the line," with 2,040,000 kw still to come.

It was the climax of three years of construction when New York's Gov. Nelson Rockefeller threw the switch. Robert Moses, State Power Authority chairman, after whom the big plant was named, looked on with satisfaction, a feeling reflected down the line to the lowliest "hardhat." It was deadline day on a $720-million job and they had made it.

By 1963 the new unit and 12 more like it will add up to 1.95 million kw of capacity while another dozen reversible pump-generators at the pumped-storage plant, about a mile away, will add an additional 240,000 kw. The Reservoir Plant, as it is called at Niagara, will be the largest pumped-storage plant anwhere in the world up to now.

Total installed capacity of the 25 units of both plants will be 2.19 million kw—216,000 kw more than that of Grand Coulee, biggest U. S. power plant and once the world's biggest. Firm capacity will be 1.8 million kw.

Before a rockslide in 1956 caused Niagara Mohawk's Schoellkopf plant to collapse, the combined U. S. hydro capacity at Niagara was 445,000 kw.

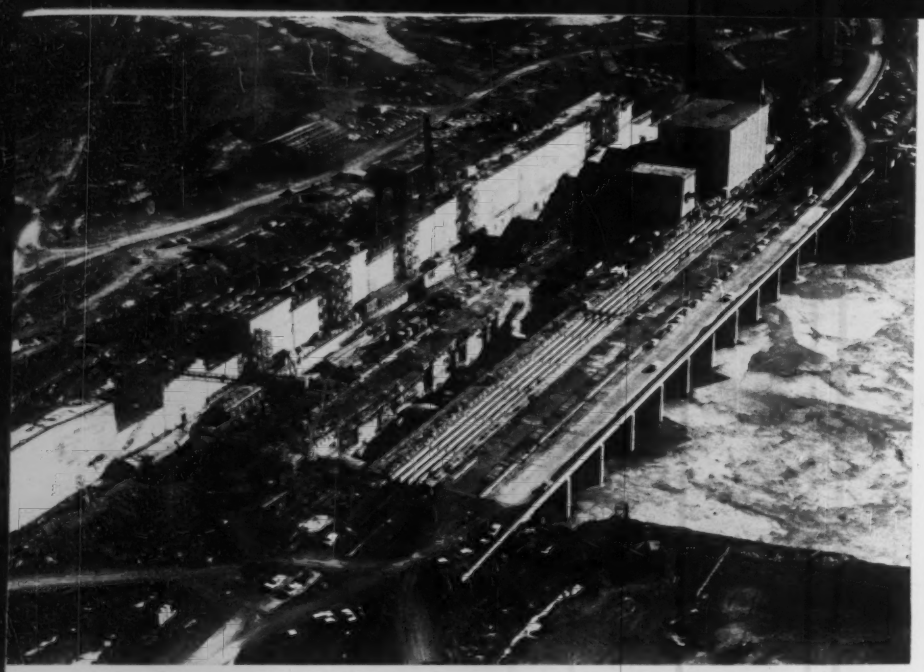
Over-all installed capacity at Niagara Falls, including the Ontario Hydro-Electric Power Commission's installations, will total well over 4 million kw by 1963. The U. S. power will be wholesaled to utilities, municipalities, and a rural electric cooperative.

Governor Rockefeller expects the additional Niagara power to alleviate the high unemployment and lagging economy of the Buffalo-Niagara region by creating 6,000 new jobs and stimulating $250 million worth of new capital investment.

• **Treaty limits diversions**—Although harnessing bits and pieces of the great Niagara Falls for power production dates back to Revolutionary days, it wasn't until 1950 that the U. S. and Canada were able to come to terms over use of the water on a grand scale. They signed a treaty that year aimed primarily at preserving the scenic beauty of the Falls, but at the same time guaranteeing both countries a fair share of Niagara River water for hydroelectric purposes.

The treaty prohibits diversions that would reduce flow over the Falls below a minimum of 100,000 cfs during daylight from April 1 to October 31—the tourist season. This limitation explains why Canada, and now the U. S., have built pumped-storage plants at Niagara. At night and during the off-season for tourists, more water can be drawn from the river above the Falls and stored for peak demand periods.

Soon after the treaty signing, Ontario Hydro went to work on its Sir Adam



PUMPED-STORAGE PLANT at Niagara will be the biggest ever built. Capacity: 240,000 kw. Reservoir area (top left) will be enclosed with dikes.

Beck Station No. 2—a development very similar in design to the U.S. Niagara project. But things were different on the New York side of the river. Political and legal fights, mainly over public vs-private power, dragged on for several years. The battlefield extended from Washington to Albany and the final skirmish took place in the U.S. Supreme Court where the N. Y. Power Authority and Tuscarora Indian tribe battled over land rights.

• **Rockslide caused power shortage**—The issue was forced in 1956 by the disastrous rockslide, just downstream of the American Falls, which demolished two-thirds of the Schoellkopf Station, the principal power producer on the U.S. side of the Niagara.

The question no longer was over public or private power. It became a matter of adequate or inadequate power; economic growth or stagnation.

The Power Authority was given the job of Niagara development by act of Congress in 1957 while the Canadians, with extensive hydroelectric development on their side of the border, were permitted to use more than their agreed share of water to supply the power needs of U.S. consumers.

• **Parks on construction site**—As the huge project nears completion, much of it is gradually disappearing from view. At the height of activity, it all but swallowed up the City of Niagara Falls (pop. 100,000). Some form of demolition or construction seemed to be going on at every corner of the city. Hardhats were by far the most popular headwear and were in evidence in even the most exclusive of the city's hotels. As many as 10,000 construction men worked on the project during the peak summer months. But this is all changing now.

Uhl, Hall & Rich, engineers on the big job, reported the total work force last week at 2,500 men.

The gaping cuts for the power conduits, up to 150 ft deep, are now backfilled, and much of the area above the conduits is being landscaped to form parks and recreation areas (Power Authority Chairman Moses is also State Park Commissioner). A 143-acre park will adjoin the pumped-storage reservoir, and a nearby golf course will receive an additional nine holes.

Spoil from the excavation has been judiciously used for various improvements. Most impressive use already in evidence is the Niagara Parkway, a scenic highway that will follow the upper river from the Grand Island Bridge down to the Falls and will, when completed, wind along the lower rapids past Whirlpool and Devils Hole parks until it crosses directly over the Moses Generating Plant and connects with the new International Bridge, now under construction by the Niagara Falls Bridge Commission. Most of the fill for the parkway and the bridge approaches is from the power project.

An unsightly and unused old power canal through the center of the city has also been filled in with spoil. And the upper end of Goat Island above the American Falls has been extended for parking space with rock excavated on the project.

Governor Rockefeller, speaking at a Chamber of Commerce dinner the night before the ceremony, announced that the state will let $12.6 million in contracts on the Niagara Expressway this year. The expressway will skirt the city connecting the North Grand Island Bridge with the new International Bridge, routing through-traffic around the city.

Mr. Rockefeller also reported the state will spend an additional $26 million in the area for railroad relocation and grade-crossing elimination.

• **The project in a nutshell**—The power conduits, two concrete tunnels 46 ft wide by 66 ft deep, start about 2.5 miles above the Falls. The intake gate locations are marked by a pair of gate towers resembling outdoor theater screens.

The visible part of the intake structures themselves look like nothing more than new concrete bulkheads lining about 1,500 ft of the river's bank. But some 13 to 26 ft below the river's surface are 96 slots that admit water.

Four and a quarter miles away the tunnels discharge into an open canal carved from solid rock. The canal—nearly a mile long, 500 ft wide and 150 ft deep—serves as a surge basin, as afterbay for the pump-generating plant, and as a forebay for the main Robert Moses plant, which extends for over 1,800 ft along the brink of the Niagara Gorge at the downstream end of the power canal.

The 60,000-acre-ft reservoir for the pump-generating plant is still under construction. It is being enclosed with dikes built of material from the canal.

Water from the power canal will drop through 13 concrete-encased steel penstocks that taper from 28-ft dia at the intakes to 21 ft at the scroll cases. The 17-ft-dia turbines at the Moses plant will operate under a 300-ft net head.

A 300-mile high-voltage tie line is nearing completion between the Niagara Power Project and its sister project, the St. Lawrence Power development. This system will permit power to be transmitted in either direction, thus benefiting both projects. Water flow on the St. Lawrence is highest in the summer, precisely when the treaty reduces water available at Niagara.

An impressive list of contractors is involved at Niagara. Merritt-Chapman & Scott Corp. is handling the Moses Plant, the river intakes, and a section of conduits. The remainder of the waterway conduits was done by two joint ventures—one comprised of the Edward Balf Co., Savin Bros., Inc., and D. W. Winkelman Co., Inc., and the other made up of Gull Contracting Co., Inc., L. G. Defelice and Son, Inc.

Channel Constructors, a joint venture of Peter Kiewit Sons, Inc., Morrison-Knudsen Co., Perini Corp., and Walsh Construction Co., have the open power canal and reservoir. The pump-generating plant is being done by Tuscarora Contractors, a joint venture of Arundel Corp., L. E. Dixon Co., and Hunkin-Conkey Construction Co.

EJC survey shows . . .

Engineer Salaries Growing 5% a Year

Engineers' salary levels rose approximately 5% per year between 1958 and 1960 according to a survey conducted by the Engineering Manpower Commission of Engineers Joint Council. Engineers in construction shared in the general increase but still lagged behind other engineers in industry (see chart).

The report shows that the median salary of all engineers in 1960 was $9,600. This compares with $6,500 for the council's first survey in 1953.

The 49% increase in seven years is well ahead of the rest of the economy. In the same period, production workers in manufacturing increased their wages by 26.8%, and the consumer price index rose 10.5%.

The survey also showed engineers' salaries to be recession-proof. Two recessions have occurred in the period covered by the council's surveys, but engineers' pay has ignored both and continued to rise at about the same rate.

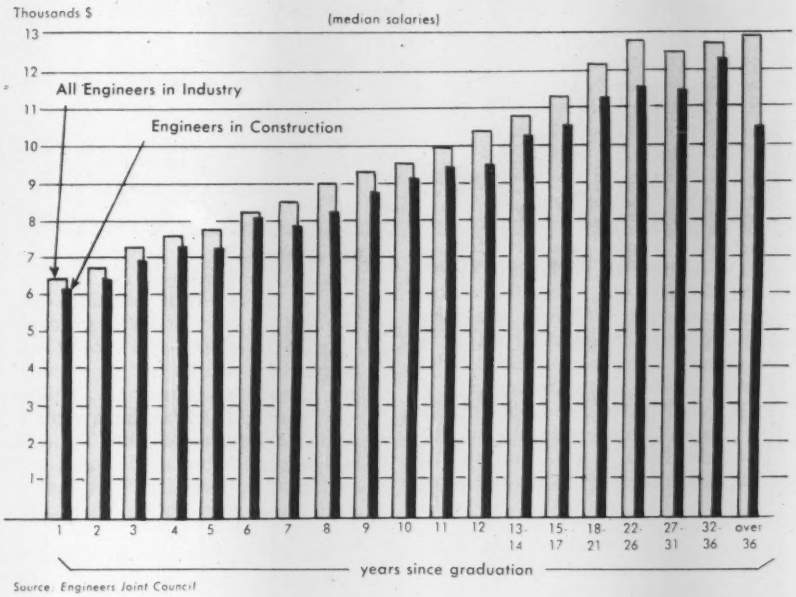
Salaries increase more during the early years of an engineer's career, the report shows. After about 20 years' experience, increases in income become smaller each year. However, this trend is beginning to slow down and constantly higher increases are becoming more common. Of the 200,000 engineers surveyed, 1.5% had annual incomes exceeding $25,000 a year.

Neither the highest nor the lowest salaried engineers stay with the trend. The most highly paid 10% find their incomes continually increasing at the same rate so that those with 35 years' experience are making over $24,000. The salaries of the lowest paid 10% level off between $8,000 and $9,000 in only 10 years.

Industry is still the source of highest income for all levels of experience. Government work comes next, with the federal government paying more than the local governments. Engineers in teaching remain at the bottom of the income ladder. But teachers' salaries are the fastest rising, having come up 14.3% in the last two years.

Engineers' Salaries

Engineers in construction vs. all engineers in industry



Construction engineers' pay lags behind engineers in all industry.

Blatnik bill would create . . .

Separate Agency to Control Pollution

Creation of a federal water pollution control administration in the Department of Health, Education and Welfare was proposed last week by Rep. John A. Blatnik (D., Minn.) as a means of meeting one of the nation's major long-range problems—the need for water.

Mr. Blatnik, author of the original federal water pollution aid bill several years ago, would take water pollution control out of the jurisdiction of the Public Health Service and make it a co-equal agency within HEW.

The White House, HEW Secretary Abraham A. Ribicoff and Surgeon General Luther L. Terry are known to be studying the Blatnik bill carefully but have not yet taken an official stand on it. However, it is likely to fare better than it did under the Eisenhower Administration, which came up with a counter-proposal in an effort to head it off (ENR Sept. 29, 1960, p. 23).

In his new bill, Mr. Blatnik would increase federal aid to localities for construction of pollution control facilities from the present $50 million to $125 million a year over the next 10 years. Funds would be allocated to the states on a matching basis.

Under the proposal, the limit for federal aid to a single community project would be increased from the current $250,000 to $600,000. It also would permit municipalities engaged in a joint project to receive federal aid on the same basis as a single community project.

The new bill would broaden federal enforcement powers in pollution abatement to include boundary and coastal waters, and intrastate streams. Federal action would still be taken, however, only at the request of a state or at the request of a community and with approval of the state. Under the present law, the federal government has no authority to order abatement of pollution in streams that are located within a single state.

AED Worried Over Prospects for '61

Last year—1960—was a "hectic, frustrating and unprofitable year" for construction equipment distributors and manufacturers. This year holds only a little promise of being better.

That was the feeling that permeated the 42nd annual meeting of Associated Equipment Distributors in Los Angeles last week.

In addition to analyses of the general condition of the construction equipment business, these specific points were emphasized:

- Better management of distributor firms is needed to combat the continuing "profit squeeze."
- The trend toward mergers of manufacturing firms will continue.
- Direct sales by manufacturers pose an increasing threat to distributors.

AED President H. J. Mayer of Western Machinery Co., San Francisco, pointed out that 1960 was the 14th consecutive year of improved construction volume. Thus, he concluded, sales problems are "of our own making."

P. E. MacAllister, a member of the AED board from Indianapolis, attributed the 1960 "flop" to inventories that were too high. And he said some publications had made over-optimistic and misleading estimates of 1960 construction volume. [ENR predicted conservatively a total of $21.9 billion in heavy construction contract awards in 1960 (ENR Jan. 28, 1960, p. 55). Total was $22.9 billion, up 12% from 1959 (ENR Jan. 26, p. 45).]

Some cautious forecasts were made for 1961. AED President Mayer said that the nation's over-all construction activity in 1961 will be 2 to 4% greater than in 1960. [ENR predicts "at least 2%" rise in contract awards in 1961 (ENR Jan. 26, p. 45).] Mr. Yontz also predicted an upturn after the first quarter, when inventory adjustments should be completed. But he felt it would not be a satisfactory year for profits.

AED President Mayer called for better business practices to overcome decreased profits. Better management techniques were dwelt on in formal sessions more than any other single subject. The construction equipment industry—particularly distributors—seems to be at a stage of development where "seat of the pants" operations must be supplanted by efficient practices for survival in the following areas of management troubles: too large and too static inventories of both new and used equipment; credit terms that are too liberal for the individual customer; warranties that are not fully covered in the sale price; and leasing practices that do not include full safeguards for the distributor.

A continued trend toward mergers of manufacturing firms was noted by several speakers. T. A. Anderson, chairman of the UCLA School of Business attributed the number of mergers to the continued profit squeeze. He said that smaller firms cannot support increased overhead including the research programs that are necessary to develop newer, more efficient equipment.

Mr. Anderson felt that mergers are necessary and desirable. But he pointed out that the federal government needs to be educated about the basic changes in our economy that make larger-scale manufacturing operations necessary. Mr. Carroll of American Hoist, on the other hand looked with alarm at the increasing number of mergers. He warned the distributors that they would have to fight to prevent a single strong line from dominating their businesses.

Richard F. Newlin of Newlin Equipment Co., Kansas City, Kan., was elected 1961 president of the Association.

No More Gargoyles?

John L. Moore, new administrator of the General Services Administration, may enliven the architecture of government buildings. As business manager and vice president of the University of Pennsylvania, he played a major role in planning the university's spectacular building program on its Philadelphia campus. And the designs of some of these buildings have bordered on the controversial, although they have won high praise from the nation's architects.

John L. Moore

Mr. Moore will not, however, favor extreme architecture for federal buildings, though he does intend to hold competitions aimed at stimulating good functional design.

Despite the admirable background he brings to his new job, the energetic Mr. Moore has been working at least 12 hours a day studying GSA's operations. His restless energy and quiet sense of humor should, however, carry him through the difficult weeks of his initiation.

Presently he is immersed in an agency survey investigating the possibility of accelerating federal contract negotiations as an anti-recession move. This survey, together with similar surveys by other federal agencies, will form the basis of President Kennedy's forthcoming budget message.

Mr. Moore contemplates few, if any, changes in bidding and negotiating procedures on federal construction and procurement contracts. Most of these are firmly established by law, and, in his opinion, have served well through the years.

Mr. Moore approaches the problem of racial discrimination by private contractors in government work cautiously. Apparently he sees his first duty as getting his job done expeditiously. But he says he will press for strict enforcement of anti-discrimination laws.

The same cautious mood characterizes his approach to the problem of maintaining federal buildings through private contractors. Each case will be decided on its merits, he says. Under no circumstances will there be wholesale firing of federal personnel.

Mr. Moore's background is chiefly academic, sprinkled with previous government service. A native of Greeley, Neb., he graduated from Villanova University in 1926, where he played varsity football.

Before World War II, Mr. Moore was an educational advisor in the Civilian Conservation Corps. He later worked with the War Production Board, the Civilian Production Administration and the War Assets Administration.

In 1950 he became comptroller at the University of Pennsylvania, later became business manager, and in 1954 was elected vice president. In this job, in addition to participating in planning the university's expansion program, he helped plan University City (ENR Oct. 20, 1960, p. 26).

Weaver Confirmed

Desegregation policy to come from JFK, he says

Robert C. Weaver, whose nomination sparked the greatest controversy of any of President Kennedy's initial appointments, was confirmed as Federal Housing Administrator last week in an anti-climactic voice vote by a sprinkling of senators present at the end of a long day of debate.

All of the vocal opposition came from Southerners. They addressed themselves to his lack of financial experience, his desegregation views and his membership in organizations that were subsequently tagged as Communist front groups.

Mr. Weaver's supporters, numbering Republicans as well as northern and western Democrats, hailed him as coming to the Housing and Home Finance Agency with the best credentials of any man ever named to head the agency (see editorial, p. 132). They claimed he withdrew from the suspect organizations as soon as he learned of their subversive nature.

Upon receiving word of his nomination to the highest federal post ever held by a Negro, Mr. Weaver said he would "work with all the members of Congress toward our common goal of better homes and better communities for all Americans."

Mr. Weaver is an advocate of "open occupancy" of federally subsidized public housing. He followed this policy as a vice chairman of New York City's Housing and Redevelopment Board. As a strong advocate of equal rights for Negroes, he was recently named chairman of the board of the National Association for the Advancement of Colored People. He will now relinquish that post.

Sen. Willis A. Robertson (D., Va.), chairman of the Senate Banking Committee, which held hearings on Mr. Weaver's nomination, told the Senate that Mr. Weaver would either push for desegregation in housing or disappoint his associates in the NAACP. During the committee hearings, Mr. Weaver had testified that as Housing Administrator he would not, and could not, go beyond policies determined by the President and Congress.

In his position with the New York City housing organization, Mr. Weaver and two other members of the board were responsible for administering New York's urban renewal and middle-income housing program, involving a quarter of a billion dollars.

A native of Washington, D.C., Mr. Weaver is a cum laude graduate of Harvard, where he also earned M. A. and Ph. D. degrees.

For Hartford's Constitution Plaza redevelopment project . . .

Glass Tower Is the Finishing Touch

A 12-story, glass-walled tower will house the headquarters offices of Phoenix Mutual Life Insurance Co. in Hartford, Conn. The new building will complete Hartford's $40-million Constitution Plaza commercial redevelopment project (ENR Oct. 27, 1960, p. 82).

The glass-walled tower will rise from a landscaped plaza which roofs most of the surrounding low-rise portion of the building. It will contain some 133,000 sq ft of office space.

The roughly elliptical layout of the tower floors will provide easy access between the peripheral office areas and the centrally located elevator and service cores. It will also reduce the wall surface of a rectangular building of equal plan area. And by isolating the building from the busy surrounding streets, Harrison & Abramowitz, New York City architects, preserve many benefits of a suburban location, which the owner had considered earlier.

A two-story rectangular base structure, 200x180 ft in plan, will occupy most of the 3¼-acre building site. Insurance service offices will enclose an interior courtyard for employees on the first floor above street level. A cafeteria, a lounge, a library will also be located at this level. Parking space for 300 cars will occupy much of the street and basement levels.

In plan, the tower encloses an area bounded by two circular arcs intersecting at two end points. It is 220 ft long with a maximum width of 84 ft measured at the center. Fourteen columns are spaced about 26 ft c-c on the locus of two arcs set 13 ft inside the exterior wall lines.

Structural engineers Edwards & Hjorth of New York City are considering both structural steel and reinforced concrete for the tower. The preliminary concrete design features grid-flat slab construction about 17 in. deep. Tapered concrete girders would cantilever from the transverse column bents. At the two ends the grid flat slab would cantilever from a double-cantilever girder at the end column, framing a triangular area roughly 20x26 ft.

The steel framing scheme would have cantilevered steel beams similar to the concrete girders, with hollow metal floor decking. At the building ends, cantilever beams parallel to the building's long axis would be required.

Framing for the low-rise portions of the building surrounding the tower will probably be reinforced concrete.

A local utility company will pipe steam and refrigerant for heating and air conditioning from a central heating plant several blocks away (ENR Feb. 2, p. 107). A high-speed distribution system will provide the tenants with year-round air and temperature control. The system also gives the architect greater design freedom by eliminating cooling towers and boiler rooms.

Demolition for the other buildings on the 12-acre site is completed. Construction of one building—the five-story Broadcast House—is well under way.

The owner-developer of Constitution Plaza, exclusive of the Phoenix Mutual Building, is Constitution Plaza, Inc. General contractor for all but one building in this largest portion of the project is F. H. McGraw & Co. of Hartford. Charles DuBose of Hartford is the project architect.

Construction Hypo in the Health Plan

President Kennedy's program for medical-payment coverage under Social Security also contained requests for construction grants of more than $750 million for medical and dental schools and nursing homes.

In calling for medical care for the aged, he noted "ability to afford adequate health care is to no avail without adequate health facilities." His grant requests include:

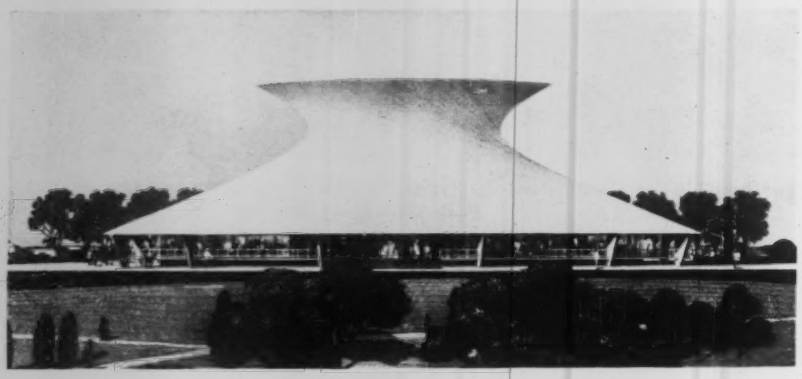
- Immediate planning grants amounting to $500,000 to help colleges and universities plan new facilities for medical and dental schools.
- A 10-year program to cost $700 million for matching grants for construction, expansion and restoration of medical and dental schools; $25 million the first year and $75 million each year thereafter.
- Double the present annual authorization of $10 million in matching grants for construction of nursing homes.
- Increase annual matching grants for construction of medical research facilities from $30 million to $50 million a year.

The President also proposes a research program aimed at developing new methods of building hospitals and organizing hospital services so as to provide most economical and efficient use of the structures built. Hospitals account for more than $6 billion a year of the nation's gross expenditures, but little has been done to try to make them more efficient, he says. He urged more intensive regional and area planning for hospitals as one approach. The President also asked Congress to remove the present appropriations ceiling for research in this area and determine anew each year the amount necessary. He requested that the Surgeon General be authorized to make project grants for construction of experimental or demonstration hospitals and other medical facilities.

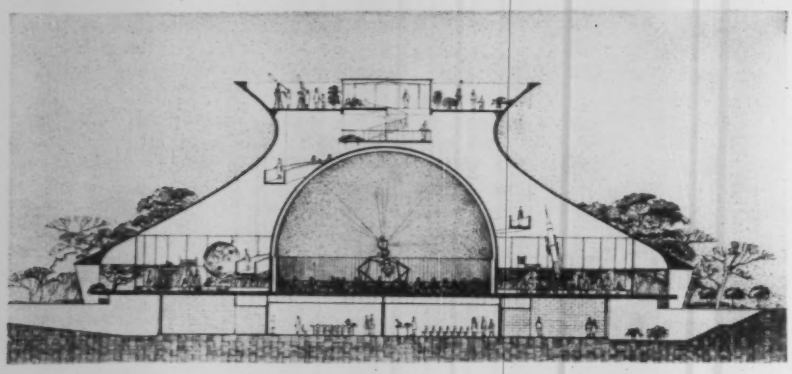
Need for new medical facilities would be spurred by making 14.2 million persons over 65 eligible for pre-paid care beginning Jan. 1, 1963. The program also includes $5 million a year, increasing to $21 million by 1966, in scholarships for medical and dental students.

The entire program faces rough going in Congress. Last year the House Ways and Means Committee killed a similar medical care bill and the Senate defeated it in a floor vote.

American Medical Association lobbyists predict that the legislation will fail, but Democratic legislative leaders give it a 50-50 chance of passing in trimmed from next year.



Shell Roof Over Planetarium . . .



. . . Supports Observation Platform

The hyperboloid shell roof for a planetarium under construction in St. Louis combines the advantages of a domed and a flat roof. A central flat roof area, 66 ft above grade, will serve as an observation platform for nocturnal sky-gazing.

The 3½-in.-thick reinforced concrete shell roofs a circular area of 170-ft diameter. Like its hyperbolic-paraboloid predecessor, the "hyperboloid of one sheet" has a surface generated by a moving straight line, thus making possible economical form work despite the curvature.

Twelve peripheral concrete columns, 11 ft high, are spaced at 30-deg intervals (45 ft apart) around the circumference to support the shell. These columns are 18 in. wide, tapering outward from 2-ft depth at their bases to 4 ft 6 in. at their tops.

A peripheral rib, formed by haunching the thin shell at its edge, spans between the columns. From this rib, the hyperboloid shell rises 55 ft to the level of the observation platform. Access to the platform is by a spiral ramp.

General contractor on the $900,000 building is Gamble Construction Co. of St. Louis. Architect is Helmuth, Obata & Kassabaum, Inc. Structural engineer is Albert Alper. All are St. Louis-based companies.

Court OKs Road Bid Specs Calling for Cement Only

A plea to enjoin the letting of a highway construction contract on grounds the Florida Road Department discriminated against asphalt by specifying bids be based on portland-cement concrete was denied by a state court.

The taxpayer action was brought by W. R. Dorminey of Miami. He charged that an asphaltic-concrete pavement could save $400,000 on two Miami Expressway jobs that totaled $3.9 million.

Judge Hugh Taylor of Leon County Circuit Court, Tallahassee, ruled the department had not acted unreasonably or arbitrarily.

He said: "It would be just as bad, and perhaps worse for the court to improperly invade the executive field and assume to determine the type of paving."

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Around the World . . .

• **Losing at bridge**—A commercial artist in Sunderland, England, drew a nine-month jail term for trying to steal one of the town's steel footbridges. The sentencing judge described the act as "monstrous impertinence."

• **Catching up**—Pennsylvania's State Highway Department announced plans to expand the 25-mile Schuylkill Expressway. Although only two years old, the $200-million expressway carries more traffic now than planners forecast for it in 1970.

• **Spanish nuclear agency**—Spain has created a new government body to deal with public works construction problems involving nuclear energy. Activities concerning the new agency include the construction of atomic power plants.

• **The lane in Spain**—Spain has authorized a 16-year construction and modernization program for a new network of high-speed modern highways and bridges.

• **Weatherproof stadium OK'd**—Houston voters have approved an $18-million bond issue for construction of a plastic-domed, air-conditioned stadium. The translucent roof will span the 640-ft diameter across the stadium, shielding 44,000 during the baseball season and an additional 10,000 during the football season. Target date for completion is April 1962.

• **Mersey misery**—Municipal authorities in Liverpool and Birkenhead, England, learned they will have to raise $100.8 million to solve the intercity traffic jam caused by limitations of the 26-year-old traffic tunnel linking them under the Mersey River. Consultants recommended a $75.6-million suspension bridge for the '60s and a $25.2-million tunnel to handle the '70s traffic.

• **Powerful spending** – Consolidated Edison Co. of New York will spend $300 million on construction this year. Funds will be provided by sales of $225 million of new securities.

• **New code for New York?**—Three building industry organizations are jointly financing a study seen as a preliminary to rewriting New York City's antiquated building code. A team of engineering professors from the Polytechnic Institute of Brooklyn is expected to report its recommendations on code revision procedures this spring. The New York Building Congress, the Building Trades' Employers Association and the Investing Builders Association are the sponsors.

• **Another pipeline** – The Canadian government has approved construction of a 500-mile, $35-million pipeline between the Peace River oil fields and the northern terminus of an existing line from Kamloops to Vancouver, B. C.

• **Roads for Detroit**—A new five-year highway construction program in Michigan will cost nearly $400 million. Most of the money will be spent in doubling Detroit's 24 miles of expressway.

Snow-Melting Schemes Too Hot to Handle

New York City officials responsible for snow removal have come through three heavy snowstorms in two months with a resigned faith in the old-fashioned snow shovel and a strong back.

"We get hundreds of letters every winter from people with ideas of snow removal," says Murray Herman, deputy director of engineering of the Department of Sanitation. "We're always ready to read them and many of them we try out, but so far no one has come up with anything better than strong back labor."

Most of the suggestions involve flame, such as a rank of blowtorches sweeping along the street or the exhaust of a jet engine. These are rejected because of obvious fire hazards and the probable damage to pavement because of the inability to adjust the flame rapidly to varying depths of snow.

Among the ideas under serious consideration are a chemical additive to street pavements that would melt snow through an electrolytic action, and the use of a truck-trailer unit that would melt snow as it plows it, leaving the resultant water to run off into gutters.

The use of radiant heat for snow melting is proposed frequently, but so far seems unlikely to be adopted. At one time, when 42nd St. was being widened, the city prepared plans to install a radiant heat system there. But the project was abandoned because of excessive cost and the expected damage to the street's asphalt surface. Most of New York's principal streets are asphalt

Many of the city's private organizations use radiant heating to get rid of snow on their sidewalks and driveways. One of the first was Best & Co., a 5th Ave. department store, which installed wrought iron piping in the sidewalk around the store and pumped a heated mixture of water and anti-freeze through it. Installed early in 1947, it was able to cope with the heaviest snowfall in the city's history, in December, 1947. The system cost about $1 an hour to operate. The pipes have since corroded and it no longer works efficiently.

The Port of New York Authority bus terminal makes the widest use of radiant heat to combat snow. Six miles of pipe embedded in the concrete surfaces of ramps that connect the terminal with the Lincoln Tunnel circulate a heated, oil-base liquid during snowfalls. This system, capable of handling 1 in. of snow per hour, kept the 1½-acre surface of the ramps clean through recent storms.

Most of the city's other users of radiant heat for snow melting are shops and office buildings. A night club, the 21, also uses it. Electric heating cable is used instead of liquid carrying pipes in many installations.

State Increases Gas Tax To Save Highway Program

Pennsylvania's Gov. David L. Lawrence won his two-year fight for two cents last week. His victory means an additional $74 million for his state's highway construction.

On April 1 Pennsylvania's gasoline tax will jump from five cents to seven cents a gallon. This is the increase that Secretary of Highways Park H. Martin argued was necessary to carry out the highway program (ENR Jan. 12, p. 47).

Governor Lawrence signed the bill into law the day after the 50-member State Senate approved it.

At the same time, the governor signed a bill expanding the borrowing power of the Pennsylvania Highway and Bridge Authority by $300 million. Under this program bonds will be issued against future federal grants for the Interstate highway system at the rate of $50 million a year for six years.

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Fitting Cities to the Future

Rochester Brings

An ENR Staff Report

Traditionally conservative Rochester, N. Y., is in a fervor of urban rebuilding.

New projects are being introduced at such a rapid pace that almost every major downtown street now boasts a yawning excavation. The efforts include some radical innovations in urban development.

Already under way are: a striking looped highway project; a $25-million downtown shopping plaza—unusual in that it is being financed entirely by private capital; a $50-million civic center; extensive downtown parking facilities; an industrial park; harbor and airport construction; and a host of other municipal improvements.

A revised land-use plan and a new city zoning code are certain to encourage further developments.

Rochester's reconstruction is one which other cities may learn from. It is an outstanding example of how well-conceived municipal projects can inspire private enterprise to invest its own money and efforts in urban renewal. Like a chain reaction, plans for one development are inciting plans for another.

Rochester's spurt of energy was prompted by many of the same problems that now confront other U. S. cities. During the postwar years its downtown area steadily lost business to the surrounding growing suburbs. Access roads to the center of the city became inadequate for growing population demands. Parking facilities were meager and costly. Many commercial and residential areas were fast becoming antiquated. Slums sprouted in several neighborhoods.

No major civic rehabilitation had taken place for more than two decades.

Fortunately, three assets enabled Rochester to act quickly to arrest the decline:

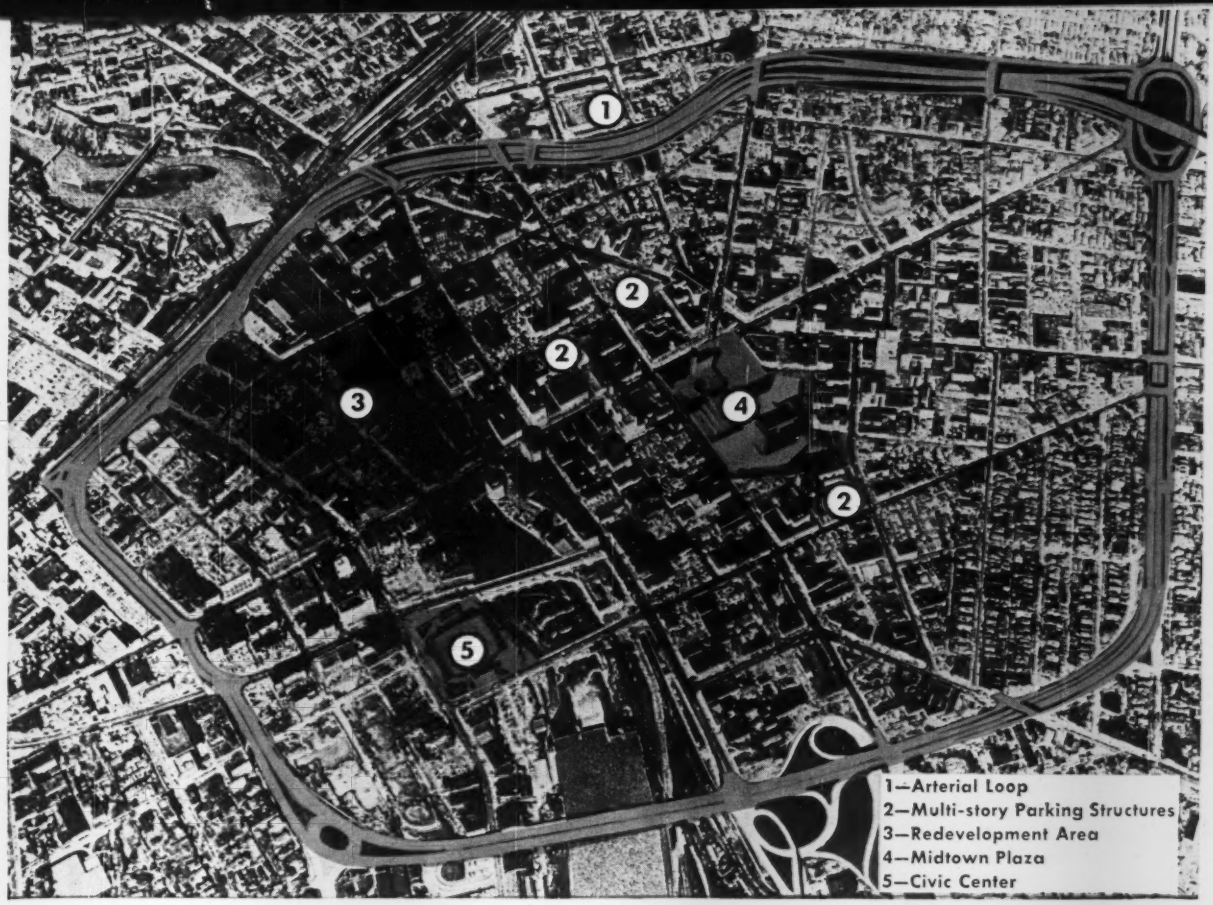
• First, the city was in an unusually good financial position. Ever since 1936, when Rochester's debt hit an all-time high of $80 million, the city administration has been preoccupied with reduction measures. For years all major capital improvement programs were shunned. By 1952 the debt was down to a low of $18.5 million and the city enjoyed a triple-A credit rating. Consequently when redevelopment action began, the city could obtain loans at favorable interest rates.

• Second, Rochester, although a metropolis of 320,000, operates in many ways like a small town. About 50 persons, mostly members of old Rochester families and business leaders, control all the important civic committees and have tremendous public influence. In the case of the redevelopment schemes, these influentials were convinced that the costly improvements were a good thing, and gave them their active support.

• Third, Rochester has an effective city manager form of government. The city manager, a non-partisan employee of the City Council, screens all civic improvement proposals and makes recommendations to the Council. Authorization to sell bonds for a redevelopment project is then obtained simply by vote of the nine-man City Council. No citizen's referendum is needed.

In 1955, following some tentative redevelopment measures, Rochester

Focus: Rochester. Application: Anywhere. This special report finds Rochester, N. Y., fitting itself for its future. Earlier reports: Philadelphia (ENR Oct. 13, 1960, p. 41); Pittsburgh (ENR Nov. 19, 1959, p. 55).



THE PLAN: to prepare for future growth with new highways, business and residential areas and municipal projects.

Them Back From the Suburbs

finally scrapped its "pay-as-you-go" policy and approved its first long-term bond issue. The ice had been broken. From that point on, a bold building program has been changing the face of the city.

• **Beginnings at the river**—Rochester grew up in the early 1800's on both sides of the Genesee River where it empties into Lake Ontario. The falls of the river provided the power that made the place a flour milling center. The opening of the Erie Canal in 1824 made Rochester one of the biggest boom towns in the East.

As the 19th Century moved on, the mills closed and moved West. The once-tempestuous river, dividing the town into east and west, was spanned with bridges. New industries moved into Rochester. Like the river, the city settled down to a period of sober respectability.

But the flour mills had established a pattern that remains to this day. The streets of the city line up like the spokes of a wheel, all converging toward the river where the mills were located. The result is a confusing pattern unsuited for modern transportation.

In the mid 1880's George Eastman, a local bookkeeper who had experimented successfully with photographic dry plates, opened his Kodak plant. Today Kodak Corp. employs about 30,000 people in Rochester and indirectly influences every phase of life in the city. Eastman's millions helped build the University of Rochester with the Eastman School of Music and Theater, and medical school, and the city's dental clinic.

Through a happy combination of circumstances, other light industries, including men's quality clothing and optical products, also settled in Rochester. This type of industry has saved the area from a burden that other urban areas must contend with—Rochester is a clean city.

A century ago, the city comprised 85% of the population of Monroe County. The movement out of the city after World War II, however, accelerated so sharply that today Rochester's population comprises only 54% of Monroe County.

As the postwar drain of vitality toward the suburbs gained momentum, staid Rochester was forced to take a long look at itself. The city, which had taken such satisfaction in the yearly decline of its tax debt and its status quo, found itself under seige. It was being hit hardest in its most vulnerable spot—the downtown core.

There are 36 square miles in Rochester. From one of these square miles—the downtown section where department stores are located—the city collects one-sixth of its taxes. If that downtown area continued to deteriorate, as it gave every indication of doing, great property values would be lost. Several store owners had already begun to invest their capital in the development of branch stores in the suburbs.

The city's most immediate need was to protect its major source of revenue by reversing the downtown trend.

To halt the pattern of deterioration, Rochester also would have to provide better living conditions within the city so that its residents would remain, and more conveniences so that suburbanites would come to work in the municipality. And it was essential to find ways to attract new industry and keep existing industry from being snared by the lure of land elsewhere.

The two men who probably did most to promote the revitalization of Roches-

BEFORE: Rochesterians who came downtown by car were forced to look for catch-as-catch-can parking.

AFTER: New parking ramps built by city charge low rates and are conveniently located.

ter in the 1950's were Mayor Peter Barry, a part-time elected official, and City Manager Robert P. Aex. This team pushed hard for what were then unpopular schemes and gained the cooperation of the business community. Practically every major project now under way began during the joint administration of these men. The present city manager, F. Dow Hamblin, continues the campaign with Mayor Barry.

• **Looped highways**—The key to Rochester's urban renewal is its arterial highway program. Without it many of the important projects now under way probably would not have come into being.

Rochester was among the first cities to take advantage of the expanded New York State highway program begun in 1950. Under this program, the city and state share right-of-way acquisition costs within the city limits, and the state and federal government share the construction costs of new highways.

The result is a $150-million project, started in the early 1950's, which will be two-thirds completed during the next five years.

The new construction features: a distinctive inner loop highway that encircles the central business district of Rochester; and an outer loop highway that encircles the city and part of the surrounding area. Connecting links between inner and outer loop will provide easy access to downtown from the suburbs. Additional state and Interstate highway connections complete the plan.

While a loop around downtown won't work for most cities, it was a perfect highway plan for Rochester's spoked street pattern. The three-mile long inner loop, now about half-completed and open to traffic, is already relieving automotive congestion inside the city.

When completed, the inner loop will have no grade crossings. The road will be in depressed sections with streets above. Total cost of the inner loop is estimated at $34 million; completion is scheduled for 1964.

Approximately eight miles of the outer loop also are completed and open to traffic. By 1967 the entire 25-mile circumferential loop should be finished. Its cost, excluding right-of-ways is estimated at $30 million, according to Bernard Perry, district engineer of the State Department of Public Works, who heads the highway project.

Four radials are to connect the inner and outer loop and two Interstate routes. The radials will be an extension of the state highways outside the city.

The entire new arterial system around Rochester will total 80 miles. Costs for construction outside the city limits are shared by the state and federal government; right-of-way costs are assumed wholly by the state. On the Interstate expressways the participation is 90-10 for both construction and right-of-way.

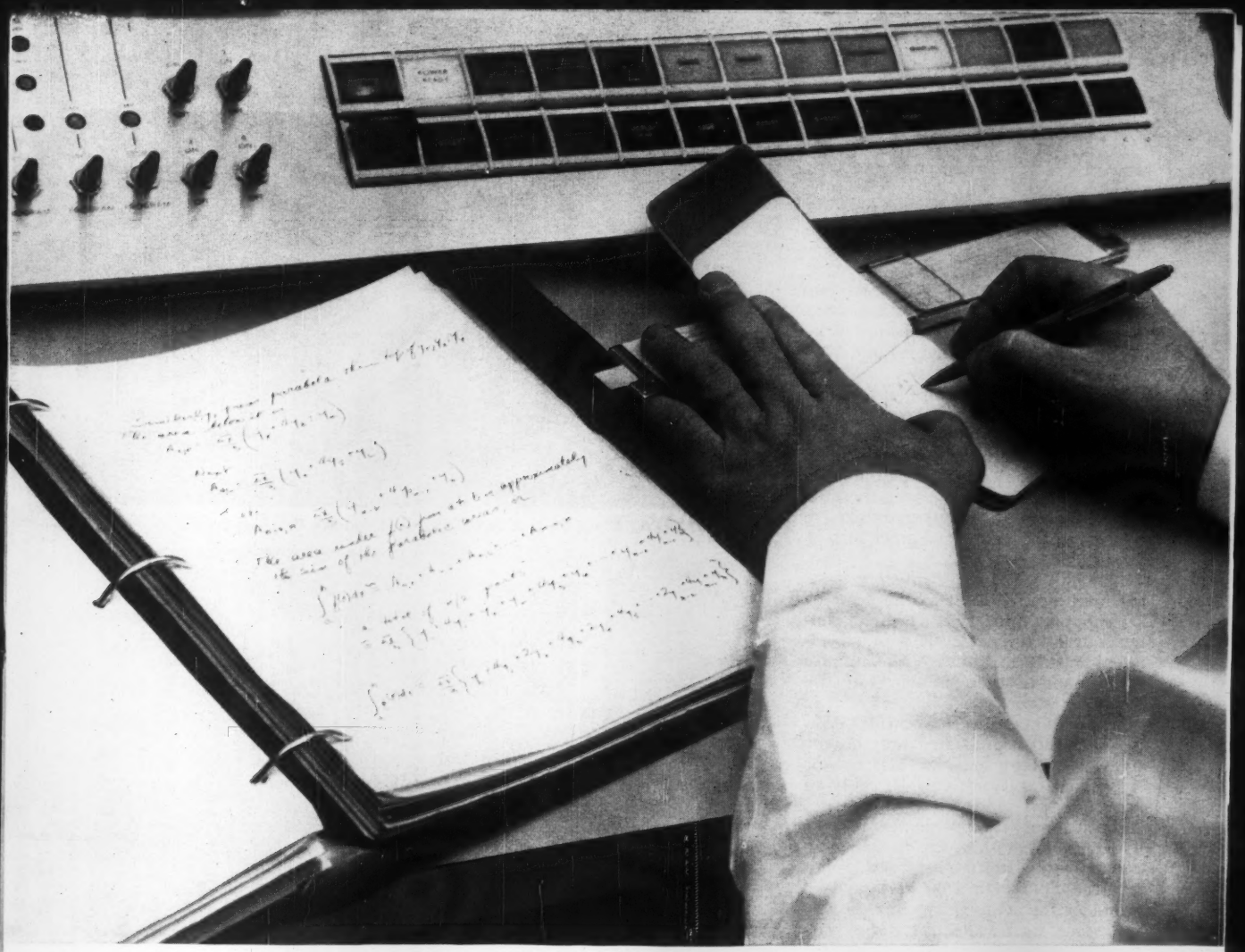
The highway project is being coordinated with public surface transportation. Bus stops will be provided on the loops and expressways so that buses can take on traffic at recesses on the side of the road. Slip ramps also will be provided for buses where radials pass under major local streets.

• **More parking**—Once the highways guarantee easy access from the suburbs into the central city, the second ingredient needed is inexpensive and convenient parking facilities.

While Rochester does have public surface transportation, most residents in the area are essentially motorists; there is a car for approximately every three persons. If they cannot come downtown by car, the odds are good that they will not come in at all.

The City Council at first tried to persuade private operators to erect the parking facilities. But the attempt failed because it proved unprofitable for

(*Story continues on p. 34.*)



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. . . Rochester Rebuilds

garage builders to use expensive downtown land and still charge the low rates the city wanted.

Finally, the city manager and city council decided that if private enterprise wouldn't do the job, the city would have to do it—profit or no. Despite considerable public skepticism, the city began to build municipal parking ramp structures behind major downtown stores and office areas.

The first parking ramp, opened in May, 1956, is a six-level structure with a 496-car capacity. It is located at the very edge of the inner loop. The second facility, a mechanical pigeon hole parking unit, opened a month later near a high-value shopping district, is located on the side of a former surface parking lot.

In 1958, a 523-car, eight-story parking ramp opened right in the heart of the shopping district. It has direct connections on several levels with an adjacent department store. A similar ramp was completed near another store the following year.

In addition, several city-owned parking lots opened. They are heavily trafficked. Rates are low; cars can be self-parked for as little as 10 cents an hour.

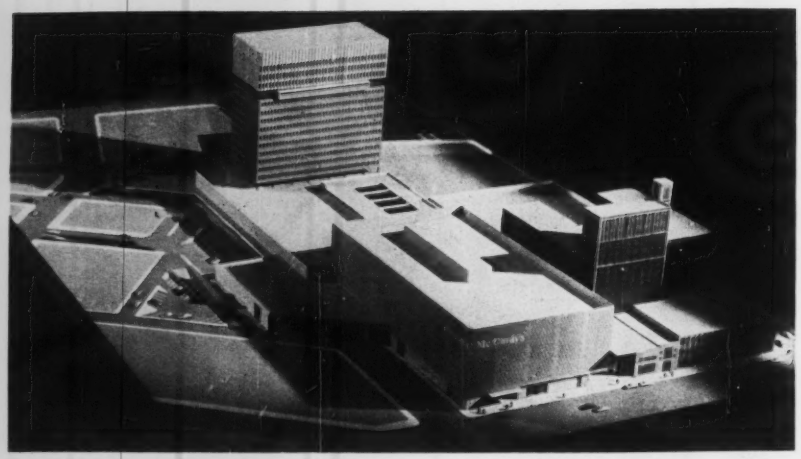
The ramps are no money makers. Their revenue just covers operating expenses and amortization, and won't give the city a return on its capital investment for many years. But the city feels they are worthwhile if they support downtown. And there is every indication that they do. One unit alone, for example, brought 150,000 shoppers into the downtown area during the Christmas season.

The garages sport some successful attractions: kiddy strollers on loan to shopping mothers, free umbrellas on loan for rainy days, and piped music.

• **Midtown Plaza**—The stage had been set by the city. Now it was up to private enterprise to take the initiative.

Slowly but steadily, private enterprise responded. Impressed by the municipal action, developers decided to construct new buildings in the downtown area. Old buildings were remodeled and restored. New apartments went up on the periphery of downtown. Motor hotels were erected at several locations within the city. And investment in suburban store construction around Rochester slowed noticeably.

The best indication that the city had been on the right track came in 1958, when local newspapers announced construction of a unique $25-million development called Midtown Plaza. The project, which involves reconstruction of seven acres of the downtown shopping area, resembles an urban renewal project. But Midtown Plaza is financed solely by private citizens—without government subsidy.



MIDTOWN PLAZA will be a novel $25-million downtown shopping center.

STRIKING FEATURE is its two-story completely enclosed pedestrian mall.

The Plaza will contain nearly a million sq ft of retailing space, some 60 new shops, two department stores a bank, and an office building for the telephone company upon its 1962 completion. An 18-story office building, capped by a four-story luxury hotel, will rise at the south end of the project.

Midtown Plaza's outstanding attraction: It will be centered around a two story pedestrian shopping mall completely enclosed by roofs and skylights and air-conditioned all year. The acre-mall will be replete with fountains, landscaping, benches and a sidewalk cafe. It will be completely closed to traffic.

The compact two level plan will limit maximum walking distance between any two shops to less than 650 ft.

The idea for Midtown Plaza was conceived when the owners of two of Rochester's major department stores—McCurdy & Co. and B. Forman Co.—met to discuss the retrogressive downtown business situation. The new highway and parking construction were important improvements, they agreed, but something additional was needed for city stores to compete with glamorous suburban shopping centers.

Gilbert McCurdy and Fred Forman consulted Victor Gruen, a New York City specialist in both shopping centers and downtown redevelopment. The outcome of the discussion between the retailers and the planner is Midtown Plaza, an urban shopping center that outglamorizes its suburban competition.

An important difference between Midtown and most new shopping developments, is that the downtown project will incorporate the two already existing downtown stores, McCurdy's and Formans, and the existing Manger Hotel, as a nucleus around which to erect new stores, buildings and malls.

The city, delighted by the turn of events, is building an $8-million garage beneath the Plaza at municipal expense. In return, Midtown has given the city a 75-year easement under the property. The city further has agreed to pay $4 million to extend a major street in the area and close two minor streets, as well as to relocate utility lines.

The city expects to gain some $400,-

(*Story continues on p. 36*)

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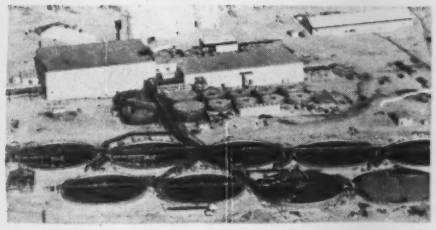

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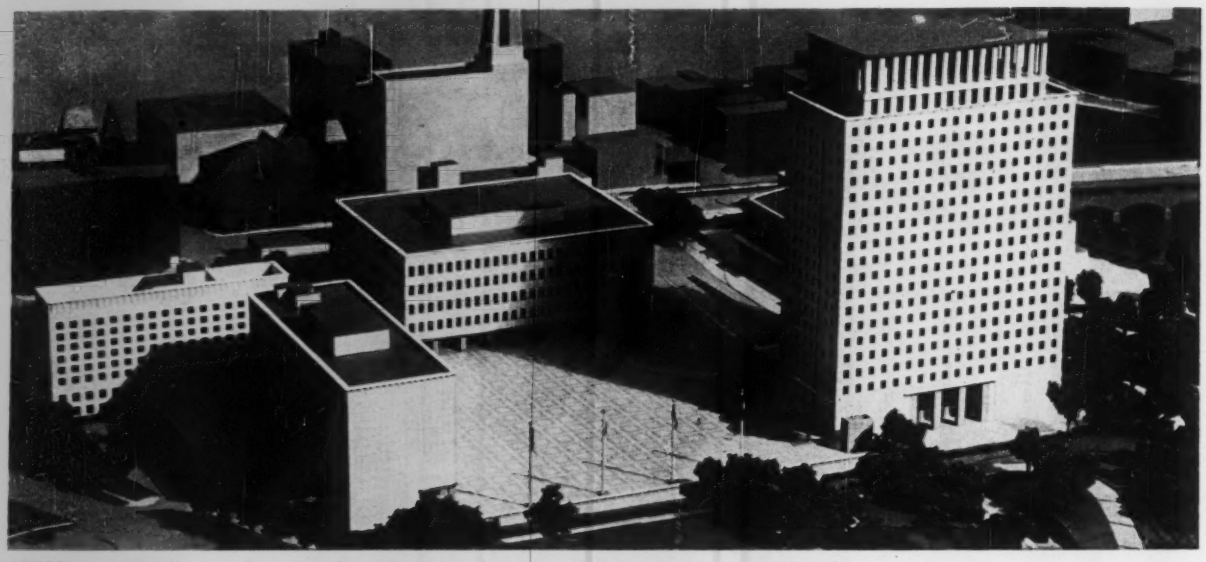
. . . Rochester Rebuilds

BEFORE: A once-stately but fast-deteriorating neighborhood on the west bank of the Genessee River.



AFTER: A $50-million civic center, being built jointly by city and county, is rejuvenating the area.

000 a year in new taxes from the downtown improvement.

• **A $50-million civic center**—Meanwhile, a $50-million joint City-County Civic Center is rising out of an aged neighborhood on the west bank of the Genesee River.

As on the east side, the promise of municipal improvements on the west side of downtown is sparking new construction and renovation of buildings in the surrounding area.

The new center will be dominated by a 22-story city-county office building that straddles an underpassed street. Adjoining it will be a city public safety building, a county public safety building and a courts building.

Space also has been provided for future state and federal structures on the 30-acre site.

All the buildings will surround a large plaza, under which two-level parking will be provided for 1,300 cars. The inner loop surrounds half the civic site, so the government buildings will be easily accessible from every part of the community.

The coordinated governmental facilities will replace antiquated structures now scattered throughout town. Rochester's city hall was built in 1874; the Monroe County courthouse dates back to 1896.

Numerous plans for a Rochester civic center have been advanced during the past 50 years.

But in each of the successive proposals, the vital element lacking to put the plans into effect was community-wide, bipartisan support.

It was not until 1953 that the proposals began to shape into reality. At that time a committee of city councilmen and county supervisors was appointed to explore ways to eliminate overlapping functions of government. It was out of that committee that the proposal for the present city-county civic center came.

Republicans and Democrats alike supported the idea, and the proposal was given strong backing by the press.

The credit for this cooperation goes to Rochester's Mayor Barry and to County Manager Gordon Howe then Chairman of the Board of Supervisors, who campaigned heavily for public support.

One civic group that aided the joint committee in formulating its needs was the Bureau of Municipal Research—a non-profit organization financed by local industry. Its reports are well thought of because they have a nonpartisan cast. (For example, the Bureau recently completed a survey that led to reorganization of fire-fighting procedures in the city.)

The Civic Center's construction is being financed largely by bond issues. The city and county will each pay for its respective buildings. In other aspects of construction, costs will be shared.

Total completion is scheduled for 1970. The underground garage and a

(*Story continues on p. 38*)

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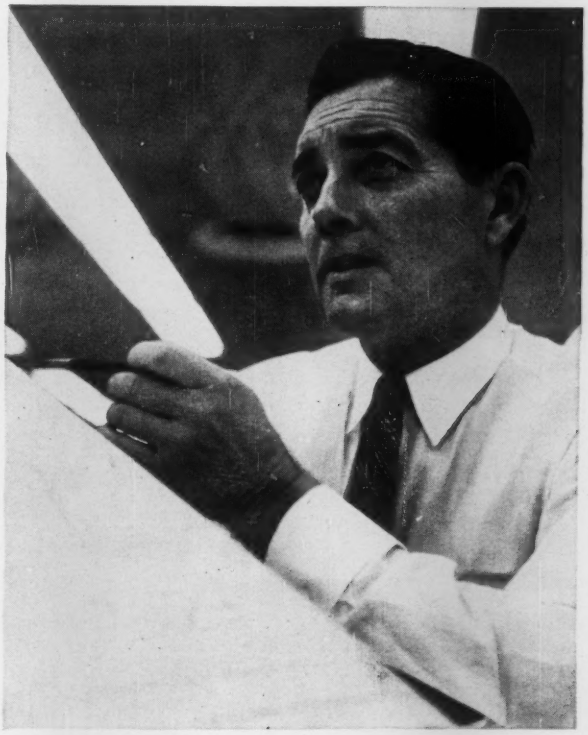

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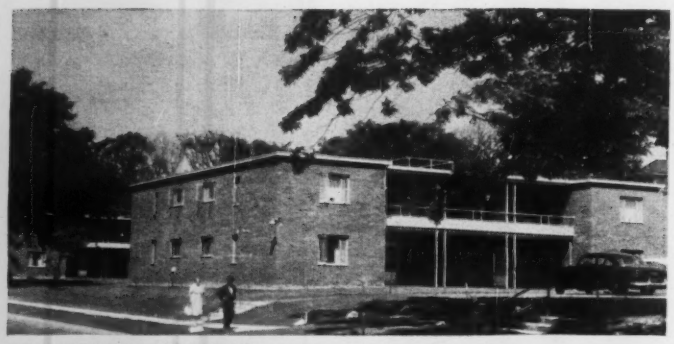


LOW-RENTAL HOUSING for the aging is under way.

MUNICIPAL IMPROVEMENTS, such as the enlargement of this sewage treatment plant, are numerous.

laboratory and maintenance building have been completed thus far.

• **Municipal improvements**—Rochester doesn't use tax abatement to attract new industries. Its good municipal services are the key to this problem.

• Rochester built two modern incinerator plants in 1954 and 1956, thereby doing away with a surface dump. A sewage treatment plant now is under construction. And further refurbishing of the sewerage system over the next few years will bring the cost of the entire anti-pollution program to $20 million.

• The city is reclaiming more than 300 acres within its boundaries for use as an industrial park.

• The Rochester-Monroe County Airport is being expanded to meet increasing travel needs. In the past 12 years, $6 million has been spent on airport construction. Another $5 million is scheduled. Airport officials hope to accommodate jets by 1965.

• The Monroe County Port Authority (another citizen's group) is widening and deepening Rochester's harbor. A new 50,000-sq-ft waterfront warehouse also is under construction by the Authority.

• Rochester's water system recently was improved with the construction of a $6-million water pumping and treatment plant on Lake Ontario.

• Fire-fighting service in Rochester has been so improved that the city moved to the third top fire rating position for cities in the nation. Eight new firehouses have been constructed.

When it comes to improving living conditions for its citizens, Rochester also has been hard at work.

• Baden-Ormond, a $15-million urban renewal project, is under way in a former 70-acre slum section immediately adjacent to the downtown area. The project calls for mixed residential-light industry use.

• Another proposal to redevelop the downtown Front Street slum area is under consideration. The suggested $61-million construction would include four nine-story apartment houses, four commercial buildings and a seven-story office building.

• Concurrently with new construction, the rehabilitation of existing homes, old streets and even whole sections of the city is progressing at a rapid rate. The effective cleanup program got under way in 1955 following municipal adoption of a Hygiene of Housing Ordinance. The key to the rehabilitation program is voluntary compliance by landlords, but the ordinance has teeth in it that are used when necessary. The City Rehabilitation Commission supervises the inspection system, which operates on a rotating neighborhood basis.

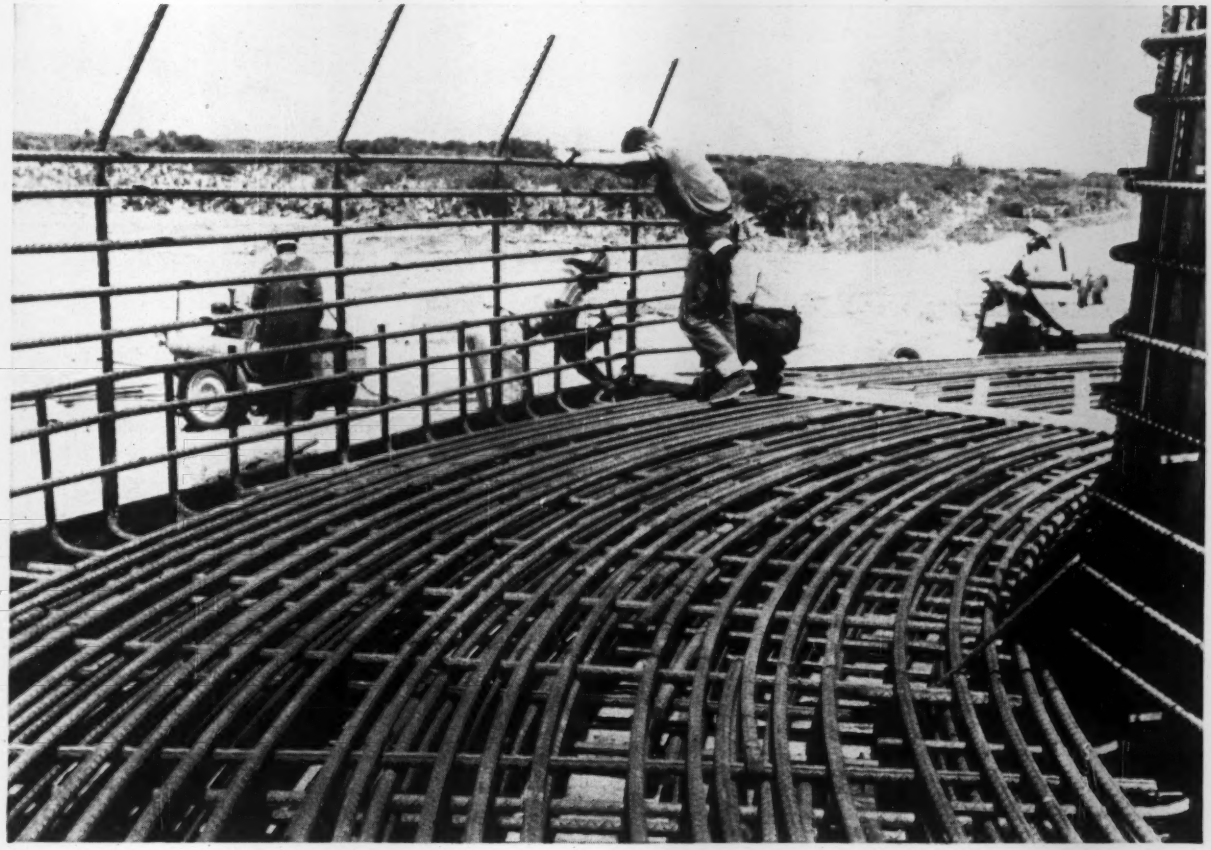
"Full community understanding and support is vital to the success of a city-wide renewal effort," says John Dale, director of the Rehabilitation Commission. "In 1956, the whole community got behind the cleanup program. Citizens raised $25,000 on their own with which they bought radio and newspaper space to advertise the campaign. As a result, more home improvement was accomplished in Rochester that year than in any previous year in the city's history."

John Dale is typical of the community-oriented citizen in Rochester. In addition to his municipal job, he serves as a member of the Rochester Management Corp., a private, non-profit organization that has undertaken a housing program for the aged. So far the corporation has built three highly successful senior citizen apartment projects, and more are planned. The city donates the land for the project and the corporation members, civic-minded businessmen, donate their time.

The zest for self-improvement also is taking Rochester into areas of social pioneering. The first housing project in the country to be established for the purpose of training problem families to adjust to the conditions of urban living was launched this winter in Rochester. Its unique feature: the problem families, instead of being isolated in low-cost housing areas, will be relocated in one and two family houses in middle-class Rochester neighborhoods.

The Rochester Housing Authority

(*Story continues on p. 40*)



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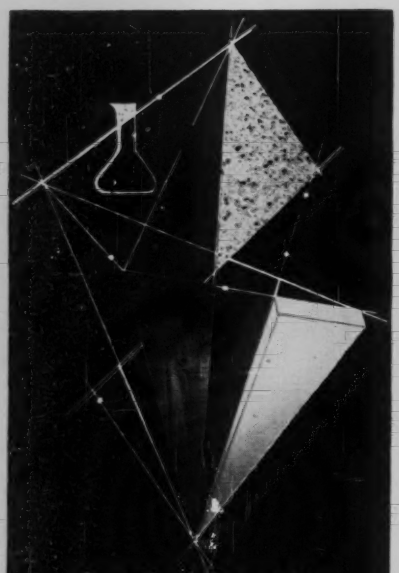

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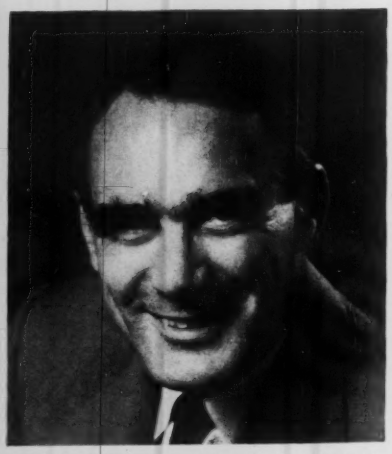
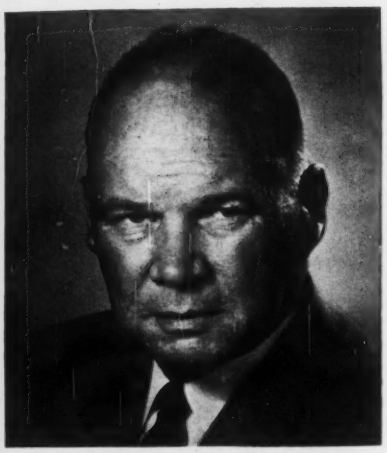


MAYOR Peter Barry is a leading force in Rochester's redevelopment.



CITY MANAGER F. Dow Hamblin is a professional municipal administrator.

will buy the dwellings for the families and charge low rentals. The program also will place heavy emphasis on obtaining a good job for the head of each household.

"We felt that placing these people in nice homes in neighborhoods where 80% of the people own their own homes will give them a sense of status and will help them considerably," said Manuel Goldman, chairman of the Authority. "The identities of the families will be kept confidential."

The project is being sponsored as a community-wide effort by civic agencies, private social agencies, and local business firms.

• **Coordinating the projects**—The coordinating agency for all building projects in Rochester is the City Planning Commission. Every scheme, whether financed by public or private funds must have the Commission's approval if it involves the development or redevelopment of land.

The planners' jurisdiction covers:

- The processing of all proposed projects and planning problems, such as zoning changes, street improvements, urban renewal, industrial development.
- The development of long-range planning for the city, including land use patterns, the integration of major thoroughfare systems and the provision of such community facilities as park and recreation, administrative and service buildings.
- The annual preparation of a city capital improvement program and cost estimates.

To determine whether a proposed project fits in with its long range community plans, the Commission has developed two effective test mechanisms.

One is a general land use plan, whose purpose it is to insure the orderly development of Rochester, based upon projected future growth of the area. The plan was established in 1947 following conception of the arterial highway layout; it has been updated several times since then.

A new zoning ordinance grew out of the land use plan. The ordinance is tailored to preserve residential areas, yet at the same time gives flexibility to industrial and commercial use regulations. It also includes parking requirements. The three-year old code contains many more preventatives for neighborhood deterioration than did the previous zoning ordinance.

The Commission itself is a child of the Rochester rennaissance. The group, though in existence for decades, had been kept dormant until the late 1940's. When the city awoke from its lethargy, the eight-man planning body was reorganized and reactivated.

The Commission serves as a recommendatory body to the City Council. It has no official authority but planning proposals carry great weight.

Public cooperation for the Commission's projects is obtained by a continuous citizen information campaign. When, for example, in 1950 the Commission undertook an intensive study of the central business district, merchants became so interested that they subsidized a big part of the study.

Rochester's plans for the future:

An inner-inner loop that would penetrate even further into the business district is being discussed for possible construction. Other urban renewal projects, hotel construction, and business ventures are in the talking stages.

"But right now we have so many projects in the works," says Mayor Barry, "that we will just have to finish some of them first and then take inventory to see what else is needed."

One thing is certain. When private industry and citizenry are willing to invest their own time and money in major community improvements, they must be firmly convinced that Rochester has a bright future.

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To meet precise pouring schedules,

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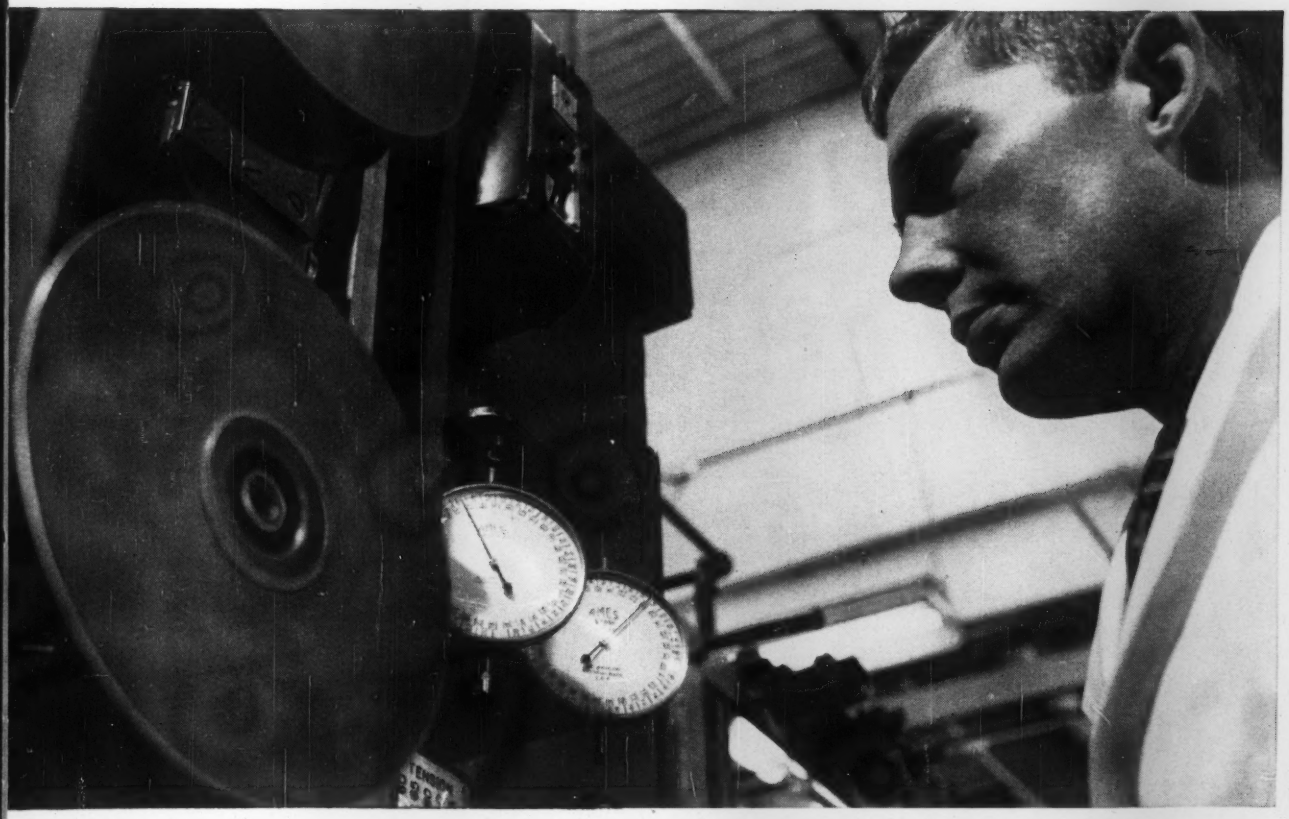

LENGTH-CODING GREEN SEAL V-BELTS TO 1/32"—NOT JUST 1/10", LIKE MOST BELTS—takes this ultra-precision machine. Only Goodyear has this type equipment, which is set by means of fine tolerance steel templates to insure accuracy. Machine readings are in the actual code numbers used to eliminate errors.

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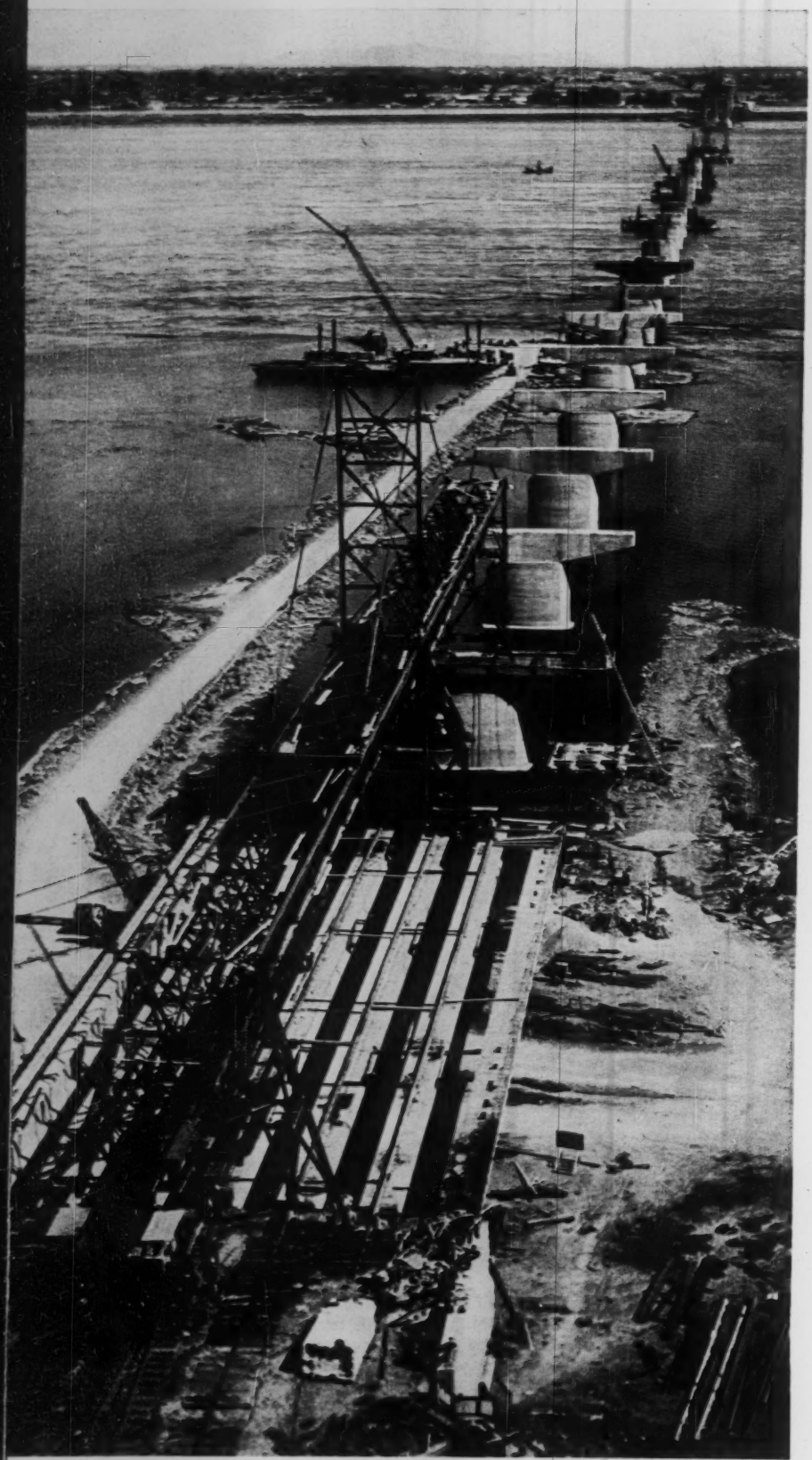
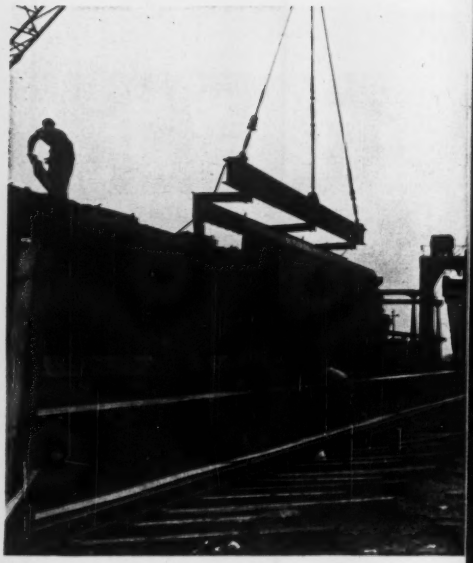


Contractor-designed launching bridge places girders.



Forms are stripped from giant

'Design and

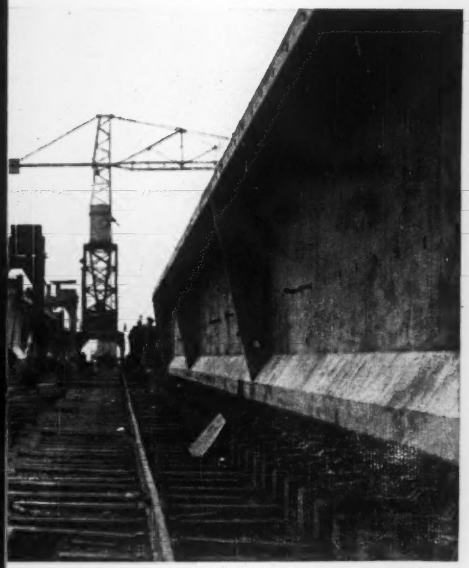
An unusual combination of European and Canadian engineering and construction skills is being employed to build a major portion of the new 4¼-mile, $35-million crossing of the St. Lawrence River in Montreal.

Forty-six spans of the Champlain Bridge are being built of prestressed concrete on a "design-and-construct" basis by a joint venture of McNamara (Quebec) Ltd., Key Construction, Inc., and Deschamps et Bélanger Ltée. Key Construction is controlled by Entreprise Fougerolle of Paris, an outstanding French engineering and construction firm. The Freyssinet system of prestressing is used on this portion of the project.

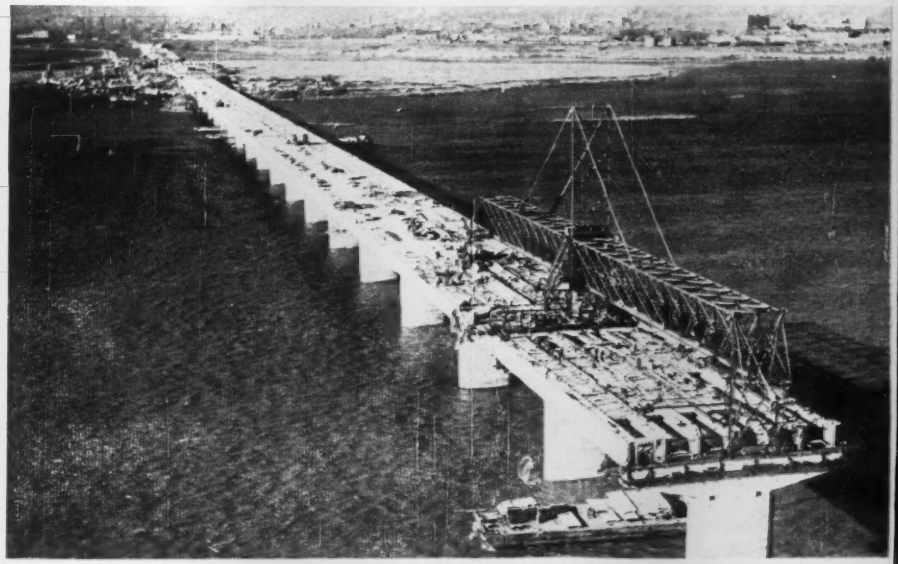
The "design-and-construct" system, common in Europe, is as unusual in Canada as it is in the U. S.

Highlights of MKD's work on the bridge include:

- Assembly line casting and stressing of 322 gigantic prestressed concrete bridge girders. Each girder is 176 ft long, about 10 ft deep and weighs about 180 tons.
- Use of a 350-ft-long, 250-ton-capacity steel launching bridge for handling and placing the prestressed girders.
- Transverse and longitudinal prestressing of the 8½-in.-thick cast-in-place concrete deck.
- Construction of spread footings for 31 river piers by the use of an unusual hinged, circular, floating template. Footings are about 34 ft in dia and extend as much as 36 ft below the water level.



girders, which go into . . .



176-ft spans of Montreal's Champlain Bridge.

Construct' Spans St. Lawrence

• Use and re-use of sectionalized forms to build pier footings and caps. Pier shafts are built by use of slip forms.

The Champlain Bridge is being built for the National Harbours Board. H. H. L. Pratley and the firm of Lalonde and Valois of Montreal are consulting engineers for the Board.

Extending from Montreal Island to the South Shore, the bridge comprises nine construction sections. The first two sections, which will be completed next year, are approach roads on the Montreal side.

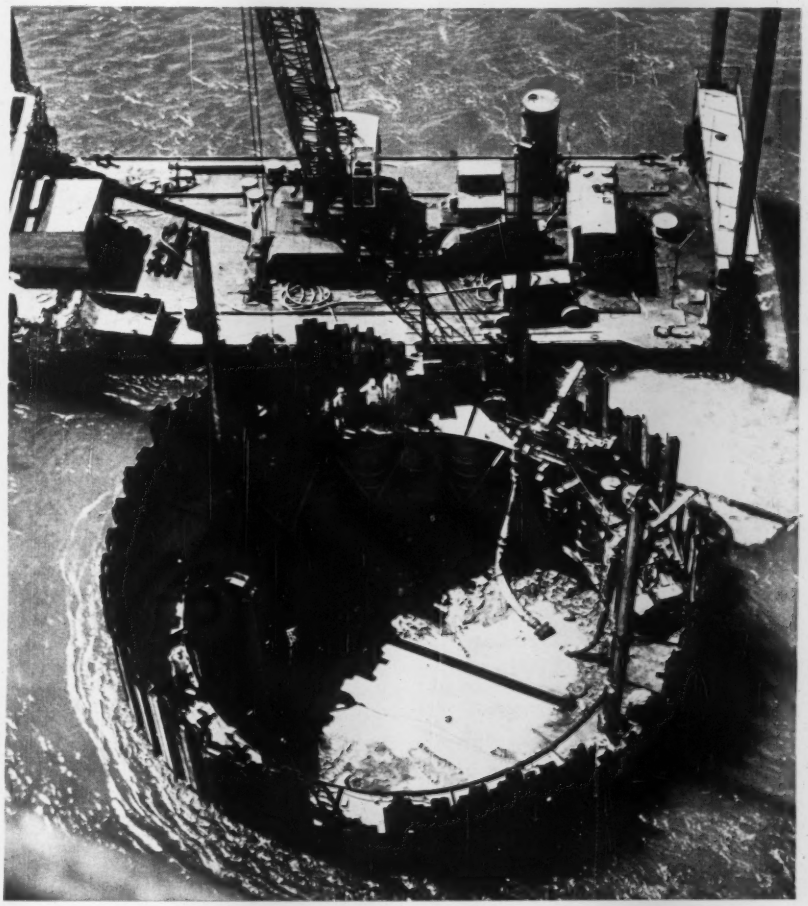
From Montreal to Nuns' Island, the crossing is a seven-lane, 12-span bridge that incorporates 132 prestressed concrete girders 128 ft long. Eleven girders are used in each span. Deck is a reinforced concrete slab resting on top of the prestressed girders.

Foundation Co. of Quebec built the eleven piers and two abutments of this section. Creaghan & Archibald Ltd. of Montreal is building the superstructure under a $1-million "design-and-construct" contract. Consulting engineers to Creaghan & Archibald are Bourgeois and Martineau of Montreal.

Across Nuns' Island the National Harbours Board will build a 226-ft-wide road. There will be nine traffic lanes in each direction at the toll plaza.

From Nuns' Island to the St. Lawrence Seaway are 40 spans being built by MKD.

The high level crossing of the Seaway comprises a 706-ft, 9-in. double steel cantilever truss and suspended truss span



Floating template is key to construction of pier foundations.

with two simple truss spans on each side. The steel spans comprise about ½ mile of bridge, incorporating 11,500 tons of steel, including about 1,500 tons of low alloy steel. Atlas Construction built the four main piers of this section before the Seaway was completed. MKD is building the remaining piers. Dominion Bridge Co. has the contract for the superstructure.

From the Seaway to the South Shore are ten prestressed concrete spans. MKD is building six of these under its over-all contract.

Both substructure and superstructure of the remaining four 172-ft spans to the South Shore are being built by A. Janin et Cie. Ltée. Approach embankments were built several years ago. The GTM stressing system is used, and the deck is stressed transversely.

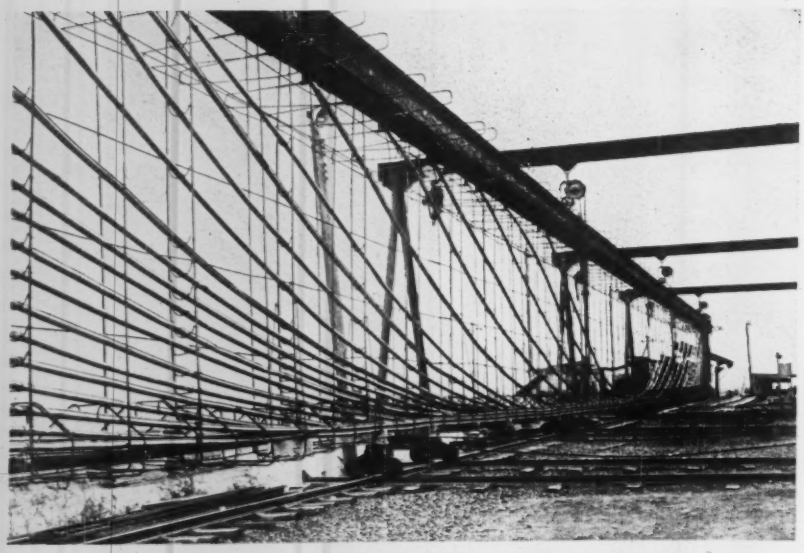
• **Competing designs**—The original call for bids for the sections being built by MKD covered designs in steel and reinforced concrete. It also allowed bids based on alternate designs proposed by the bidders. Several firms submitted bids based on their own prestressed designs. Six bids in prestressed concrete were lower than the lowest proposal based on the original design in steel. MKD finally was awarded the contract.

There are seven prestressed girders spaced 12 ft 2½ in. c-c in each span. Each T-shaped girder is about 10 ft high, 5 ft 9-in. wide at the top flange and 2 ft 3-in. wide at the heel. Web thickness is 7 in. There are four transverse diaphragms in each girder. Beginning at one end their spacings are 2 ft, 56 ft 6 in., 59 ft, 56 ft 6 in., and 2 ft. Diaphragms are reinforced and prestressed.

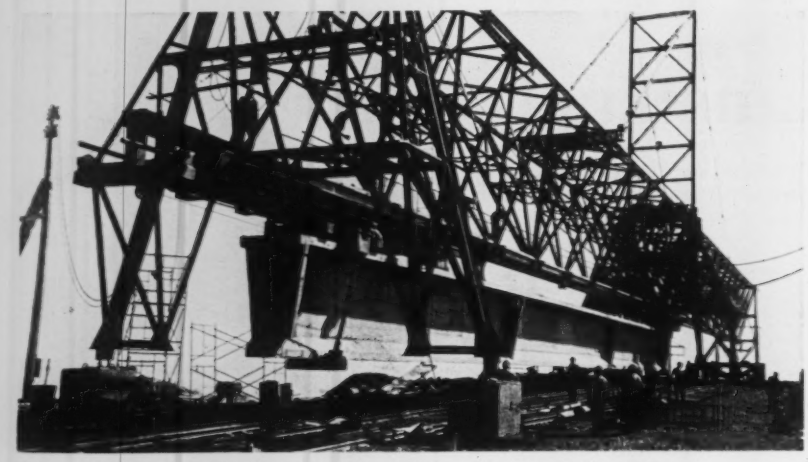
There are 24 longitudinal prestressing cables in each girder; 13 of these pass through a precast block at each end of the girder. Each cable is made up of twelve 0.276-in.-dia high-strength wires produced by the Steel Company of Canada (Stelco) in Hamilton, Ontario. Wires have a minimum ultimate strength of 235,000 psi. The project represents the first use of Canadian-produced stressing wires.

• **Girder production**—Production of the prestressed girders is carried out on an assembly line basis at a casting yard on Nuns' Island. Using eight casting beds and four sets of sectional steel forms, normal production rate is 14 girders per week (one 12-hour shift per day).

First step in constructing each girder is fabrication of the ducts. Each duct is formed from a 6-in. wide, 180-ft long strip of sheet steel by a continuous weld machine. Each cable is formed on the job site by a mechanical device that gathers together the individual wires from a battery of twelve reels and pushes the cable through the steel duct.



Prestressing cables and ducts hang on reinforcing stirrups.



Giant bridge—350 ft long—handles prestressed girders.

In a separate operation, reinforcing stirrups are preassembled on a carrying beam supported by four A-frame dollies that ride on rails. Workmen hang each of the 24 ducts (with cables inside) on hooks welded to the stirrups at preset positions. This procedure is fast and eliminates possibility of error in draping the cables. The entire assembly then is moved to the casting bed by small gantry cranes mounted on rails.

Following assembly of the steel forms, workmen place concrete in a continuous operation from one end of the girder to the other. Concrete is placed with a tower crane at a slump of 2 to 3 in., with from 4 to 6% air and a small amount of dispersing agent. Each beam requires about 88 cu yd of concrete, which is placed in about three hours, using concrete from MKD's own batch plant. External and internal vibrators consolidate the concrete.

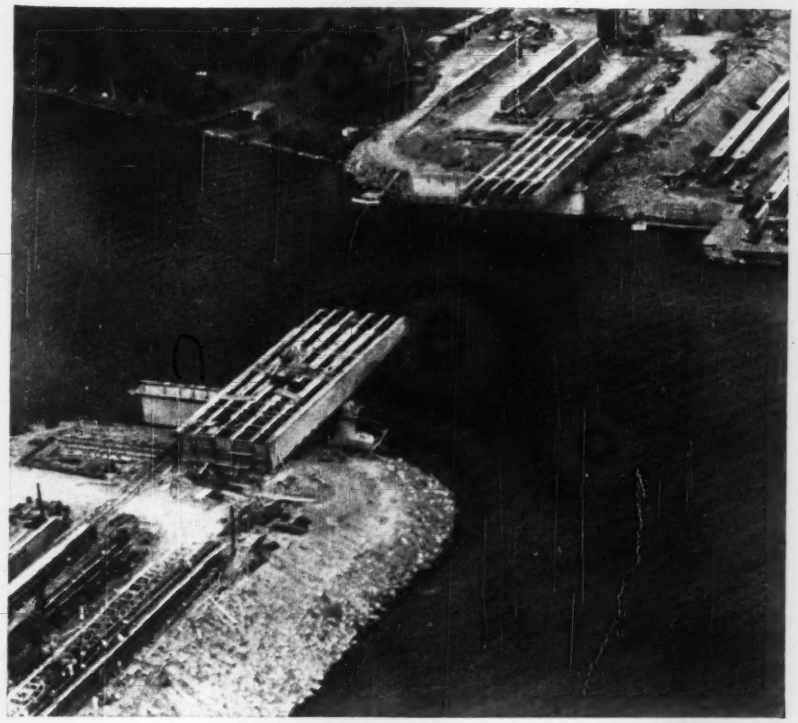
• **Handling the girders**—The casting yard resembles a railroad switching yard—everything moves on rails except one 35-ton truck crane used for stripping the forms.

The contractor strips forms from each girder twelve hours after casting. Minimum compressive strength of concrete after 48 hours—when stressing begins—is 3,500 psi. Using standard Freyssinet equipment and procedures, workers stress 14 of the cables at this stage. Straddle trucks on rails move each girder to a nearby storage area. After the concrete has attained a strength of 5,000 psi (7 to 10 days), the contractor stresses six more cables.

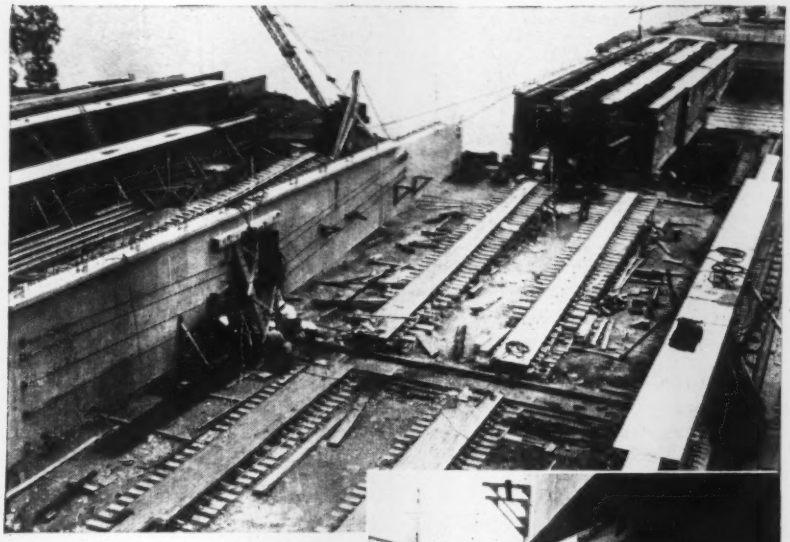
First stage of grouting the cables is done at the same time. Total initial stress on each cable is 60 tons; final working stress is about 40 tons (122,000 psi).

Grouting is completed immediately and each girder is moved by low-bed

(*Story continues p. 48*)



24 CANTILEVER GIRDERS, 147′ long and weighing 250 tons each, are hung from diaphragms set on bearings; none of the girders is supported directly from beneath. The 10 drop-in girders for the suspended span, each 231′ long and weighing 222 tons, were set between the cantilever girders and held by stressing rods passing transversely through both sets of girders and cast-in-place diaphragms.



HIGH EARLY STRENGTH, 7¾ sack concrete, made it possible to cast a girder every 14½ days with each form. Interior girder (right) has 28 tendons, containing 24 or 28 ¼″ dia. wires. Exterior cantilevers (center) have 20 tendons; drop-in girders have 12. 9″ paper tubes in external girders reduced weight.

DROP-IN GIRDERS were barged into position between cantilevers and lifted by yokes. Contractor, Terry Contracting Corp., New York City; Post-tensioning steel, Joseph T. Ryerson & Son, Inc., Chicago; Consulting engineers, Summers, Munninger & Molke, Albany, N. Y.

Post-tensioned concrete now spans 320′

Thirty-four concrete girders, poured and prestressed on the job site, now bridge Lake Oneida, New York, with maintenance-free concrete extending 460′ from abutment to abutment and spanning 320′ of open water.

Five sets of forms were assembled on three casting beds, two on the north approach and one on the south. The 24 cantilever girders were formed first. Truck mixers delivered the concrete to crane buckets which raised it to a series of tower hoppers. It was placed through elephant trunks into openings at 4′ intervals in the form and vibrated around the maze of tendons. After 5-day water curing, side forms were stripped and first stage stressing completed. Girders were rolled into place before second-stage stressing.

The 10 drop-in girders were stressed and grouted at the casting bed, then barged to the center of the bridge and raised into position. They were braced and diagonally tied so they could not move in relation to the cantilevers. Third-stage tensioning of cantilevers and casting and transverse stressing of the remaining counterweight and diaphragms completed the span work, ready for deck paving.

Concrete deliveries for this intricate job were handled by truck mixers of certified design, capacity, mixing speed and water control accuracy.

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trucks on rails over the completed bridge deck to a position to be handled by the launching bridge.

• **Launching the girders**—The launching bridge is a notable structural achievement. It is believed to be the largest structure of its kind ever used on bridge construction.

The launching bridge incorporates a triangular truss supported by three A-frames on dollies that roll on rails. A longitudinal beam carries two monorail trolleys and lifting assemblies. The bridge's mechanical and hydraulic systems are used to carry out these operations:

- Launch half its length forward from a span on which girders have been placed to the next pier. During this cantilevering operation, the monorail trolleys serve as a counterweight.
- Pick up and move one girder at a time longitudinally into position.
- Carry each girder to its correct lateral position by traveling on rails laid transversely on the pier caps.
- Lower each girder into its final position in the span. Each girder rests on a three-ply neoprene bearing pad at each end.

• **Prestressed deck**—The deck slab of each span consists of the seven flanges of the girders and of six cast-in-place intermediate strips. Similarly, the parts of the diaphragms cast with the girders are completed by cast-in-place intermediate parts. These intermediate parts of slabs and diaphragms are transversely prestressed together with the girders by means of cables passing through holes adjusted when casting the girders. Each span has 54 transverse cables that pass through the deck slab; an additional 12 transverse cables pass through the diaphragms.

After the girders are in place, workmen from the top of the girder flanges install the forms, reinforcing and transverse stressing ducts and cables for the cast-in-place parts of the slab and diaphragms, and cast the concrete.

After curing, the deck is prestressed transversely. Each cable is tensioned from one end only. The final four longitudinal cables in each girder are stressed at the same time. All stressing cables are the same type and size. Eventually, the deck will carry an asphaltic surface.

• **Pier construction**—MKD achieves a high rate of production on the river piers by three separate, yet integrated, operations. Major steps for each pier are (1) installation of a temporary cofferdam, excavation to rock and construction of the concrete footing; (2) slip forming and placing of the reinforced concrete pier shaft; and (3) construction of the reinforced concrete pier cap.

As designed, pier footings are 34 ft in dia and 18 ft high; they extend 2 ft into rock.

Freyssinet system is used to stress deck both ways.

As built, height of the footings is variable. Engineers require two borings extending 20 ft into rock at each pier location. Results of the borings (or small test shafts, in some cases) determine the depth to which excavation will be carried for each footing. In some locations, there is from 13 to 14 ft of river silt and glacial till overlying the rock. In at least one case, the footing extends 8 ft into rock. Maximum footing height is 26 ft; average is 20 ft.

• **Template for footings**—Key to construction of the footings is an unusual 50-ft-dia, 10-ft high floating steel template, which is hinged vertically. To begin construction of a footing, the template is floated into position. The template is held in place by lines from a winch scow, which is anchored by lines extending to concrete blocks on the river bottom. Workmen then drive four spuds (steel H-piles) to secure the template (see photo).

Next step is to drive interlocking steel sheet piling to form a ring around the outside of the template. The template then is sunk, if necessary, as much as 10 ft below the water surface by filling the floats with water and placing concrete blocks on top of the template. If necessary, a third ring can be installed below the template, inside the sheet piles. Pumps are used to dewater the cofferdam.

The contractor generally excavates inside the cofferdams with a small tractor shovel lowered by a barge-mounted crane. The shovel—equipped with a ripper—digs into loose or rocky material and loads large buckets, eventually lifted by the crane. In some cases, excavation is done by use of a clam-shell bucket, or by hand.

One of two available sets of footing forms is then installed and the footing is cast. Concrete is supplied by two 11-cu-yd truck mixers (serving as agitators) on a self-propelled landing craft. A portable belt loader transfers concrete from the craft to the footing.

Each reinforced concrete pier shaft is 10 ft wide at the center, 31 ft 5 in. long, with a sharp nose on either end. On the upstream side, nose of each pier will be clad in stainless steel plate to elevation 50 (about 17 ft above normal low water) to resist ice action. Height of the shafts varies from 11 to 85 ft.

• **Slip-forms for shafts**—Integral and reusable wooden slip forms 3 ft high are used to cast the pier shafts. Two sets of these slip forms are available at the job site. The contractor uses a small landing barge equipped with two 6-cu-yd mixers to supply concrete for the shafts. The mixers are loaded from truck mixers on shore. A belt conveyor is used to unload the concrete.

The contractor also uses a pre-assembled form for casting the concrete pier caps; form sections comprise steel frames with plywood facing. The pier cap form is divided into four pieces, which are lifted separately and assembled on the top of the pier shaft. The form is supported by steel beams that pass through slots on top of the pier shaft. Two sets of cap forms are available on the project.

Organization of the work is such that six spans (1,050 ft of bridge) are completed each month. This calls for casting and prestressing 42 beams, pouring and stressing six slabs and building six piers and pier caps per month.

Personnel of Key Construction are responsible for engineering and special equipment on MKD's part of the Champlain Bridge. Consultants to MKD are Warycha and Skotecky of Montreal and the Societe Technique pour l'Utilization de la Precontrainte (STUP) of Paris.

Pierre H. Mora is project director for the MKD joint venture; Jacques Dery is project manager. Maurice Berthault is chief engineer, and project engineers are Graham Earle (precast beams and slab); Raymond Pessayre (launching bridge); and Paul Brais (substructure).

As the building boom in Florida continues to meet and exceed all expectations, more and more Marions are being called upon to lend their muscles to the task.

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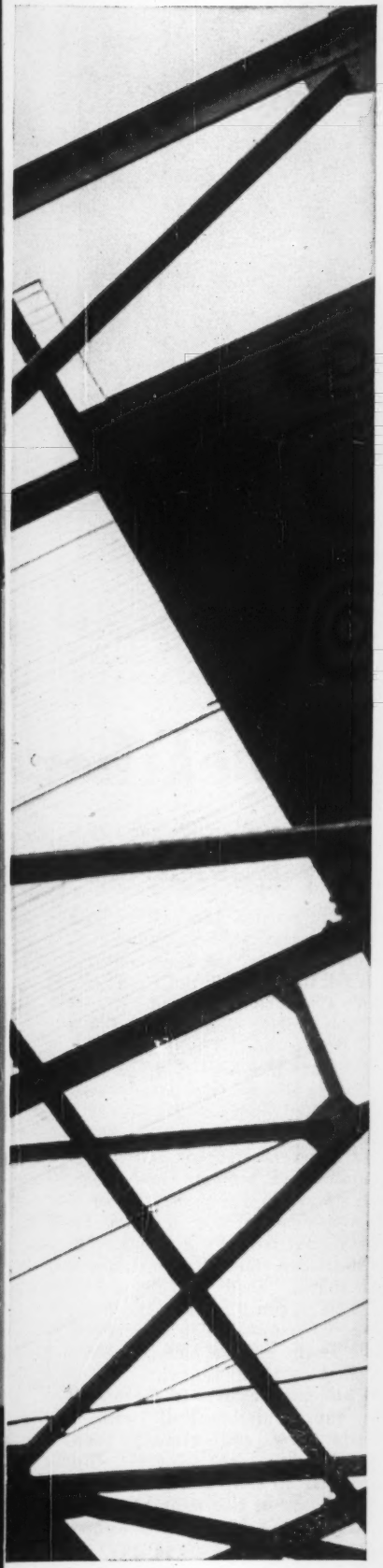

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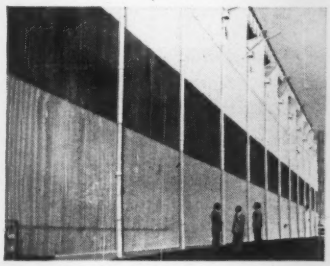

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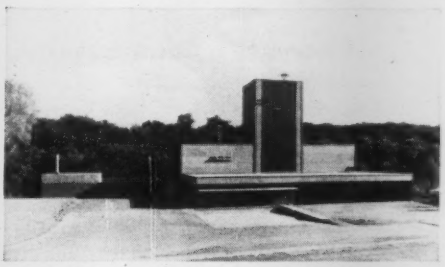

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ATLAS LAUNCHING SILO is a concrete-lined, 180-ft-deep hole in the ground. At this site near Ellenburg, N. Y., the smaller hole will house the launch control center. Excavators encountered rock just below surface here and at five other ICBM launch sites.

Builders Battle Rock, Weather

Last summer, when the uproar over the lag in missile base construction threatened to overshadow the U-2 incident, the summit failure and pre-convention political maneuverings, a four-company joint venture won a contract to build an Atlas ICBM base in the Adirondacks.

The importance of staying on schedule was obvious, but the project was a contractor's obstacle course.

• The 12 sites for underground launching silos are spread out in a rough circle around Plattsburgh Air Force Base, N. Y. (see map). A tour of inspection that permits only a few minutes at each site takes eight hours and covers 235 miles.

• Six of the 180-ft-deep silo holes had to be gouged out of solid rock. From 60 ft to 130 ft of rock had to be removed from most of the others.

• Construction has to go on throughout the winter, despite a heavy snowfall and cold that averages zero and goes as low as a −28F.

• The contracting agency, the Corps of Engineers, wants the project built with peacetime formalities and wartime speed.

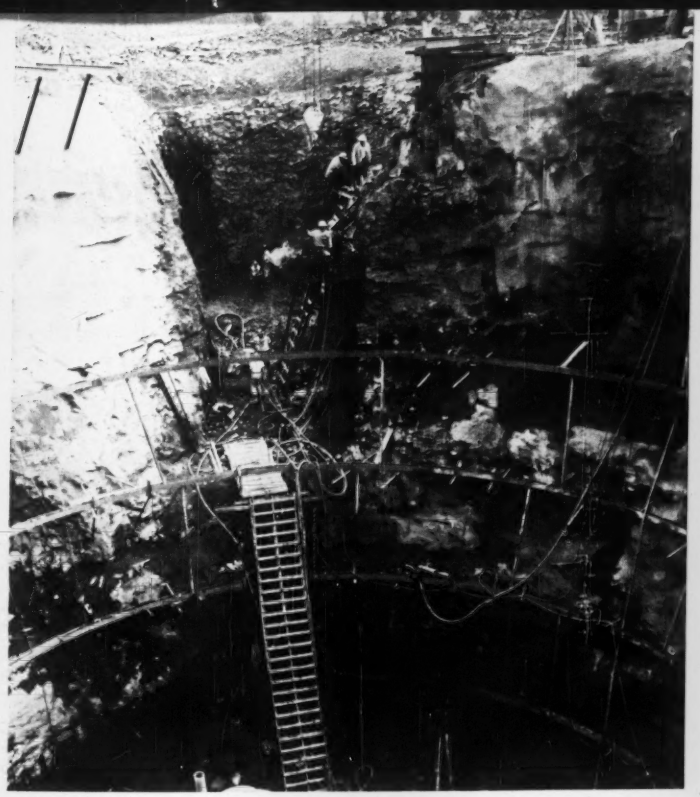
Bids were opened June 10 and on June 14 the contract was awarded to a venture composed of Raymond International, Inc., New York City; Henry J. Kaiser Co., Oakland, Calif.; Macco Corp., Paramount, Calif., and Puget Sound Bridge and Drydock Corp., Seattle. The bid was $24,408,000. Work began three days later. Completion was set for November, 1961.

Each underground Atlas launching complex is an elaborate air raid shelter that houses and protects the missile, its fuel, a power plant, a control center, water supply and living quarters for personnel. But basically, the Atlas silo is a 180-ft-deep, 60-ft-dia hole in the ground that is lined with reinforced concrete. The control center and other supplementary units are in a neighboring hole in the ground and connected to the silo by a 100-ft tunnel.

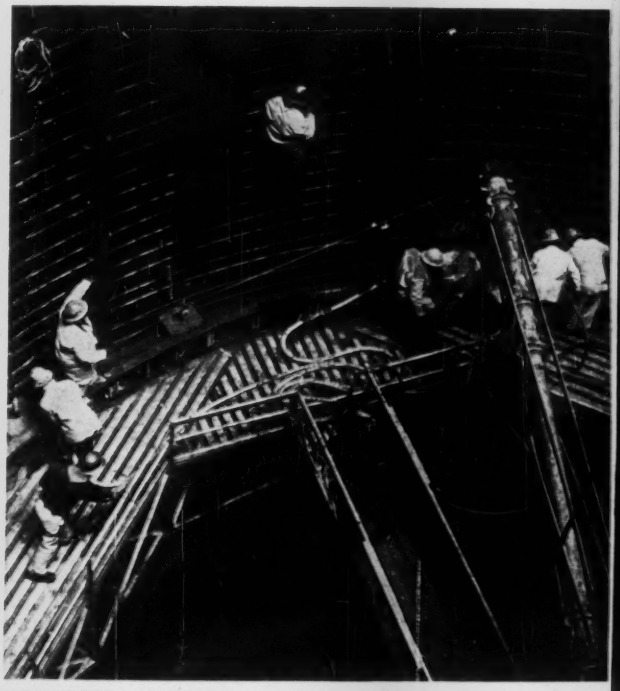
The builders began work at all 12 launch sites simultaneously with a 1,000-man crew and running three shifts a day, six days a week. Site clearance was an early difficulty. Eight of the sites are in the mountains and are covered with a dense growth known in the area as Adirondack jungle.

Under the Sugarbush: An Atlas Nest

The Atlas launching complexes are located outside such idyllic sounding villages as Sugarbush, Au Sable Forks, Chazy Lakes, Harrigan Corners and Bouquet. Although names like these evoke images of Christmas-card winters and richly colored autumns, these and the other seven villages will become the deadliest spots in the Northeast. Each Atlas will carry a nuclear warhead 150 times as powerful as the A-bomb that devastated Hiroshima. The base, which is dispersed over a 1,600-sq-mile area around Plattsburgh, N. Y., is the first Atlas installation east of the Mississippi River.



RING BEAMS prevent cave-ins of silo wall. Concrete sprayed on wire mesh applied to wall halts slough-off. Trench links silo with control center.



CONCRETE IS PUMPED through 8-in. tube, placed behind steel slipform. Vertical channels guide form.

and Time to Finish Atlas Base

They encountered rock just below the surface on half the sites, dense shale that wore out tungsten carbide bits after five or six feet of drilling. At the site near Champlain they had to go through solid quartzite.

Outside Mooers Forks, the combine encountered so much groundwater that it had to build two cofferdams, one inside the other, to get down 180 ft.

The Raymond-Kaiser-Macco-Puget Sound group was on schedule, even a bit ahead, until it ran into quicksand at one site and a broad fault zone at another.

Quicksand accounts for most of the 85 ft of overburden at one site. The excavators are injecting a chemical grout at the perimeter of the silo hole to solidify the quicksand and sinking a series of 200-ft wells in a circle 40 ft from the edge of the hole from which to drain the area. As they go down to bedrock, they will install steel sheeting around the circumference of the silo.

A fault zone allowed an unmanageable amount of water to flow into another silo excavation. At 110 ft down and 70 ft to go, the builders plugged up the bottom of the hole with a 4-ft-deep concrete slab. Then they drilled through the slab and into the walls to inject cement grout under high pressure to plug the seams. After the grouting is finished, they'll excavate through the slab down to 180 ft.

Now the venture has completed excavation of all but these two sites. Concrete work, which began less than four months after groundbreaking, is finished at six of the launcher installations and 50% completed at four others.

The builders are using steel slipforms to place concrete for the silos. Although slip-forms aren't new to missile base work, the Plattsburgh job is probably the first on which steel forms have been used. Steel was chosen because it offered less friction resistance and because the forms can last out the job without resurfacing.

Each form is a 6-ft-deep cylindrical unit that measures 52 ft, 2 in. across the top and 52 ft, 1 in. at the bottom. The taper prevents a bond from forming at the lower end of the slip-form.

Each of the four forms in use on the Plattsburgh base is made up of four 90-deg truss-braced segments. When a form is assembled in a silo hole, two cross bridges span the top of it to serve as stiffeners and work platform. Steel flooring on top of the forms provides additional work space.

After the 4-ft base slab is in place and reinforcing steel for the walls of the tube is installed, concreting begins.

As concreting progresses, the form climbs up the tube on 20 1-in. steel rods that hang from outriggers projecting over the lip of the hole. Hydraulic jacks pull the form up by 1-in. increments on the monkey-on-a-stick principle at 30 in. per hour.

Instead of a crane and bucket placement of concrete, the Plattsburgh builders pump the concrete into the hole through an 8-in. pipe that hangs in the center of the hole and has a swivel joint at the bottom. One man continually walks the pipe around the form to place concrete evenly.

Workmen on a scaffold mounted under the form finish the concrete walls.

Two continuous pours are required to complete the walls of an Atlas silo. The first pour carries the walls to a height of 125 ft, in which distance the wall is as thin as 2½ ft. From the 125-ft level on up, the wall of a silo increases in thickness to 9 ft.

Heavy, reinforced concrete doors will cover the completed Atlas at the surface. At a fire order the doors will open automatically and the missile fuel, refined kerosene and liquid oxygen, will be pumped into the Atlas. An elevator will raise the ICBM to grade level for firing.

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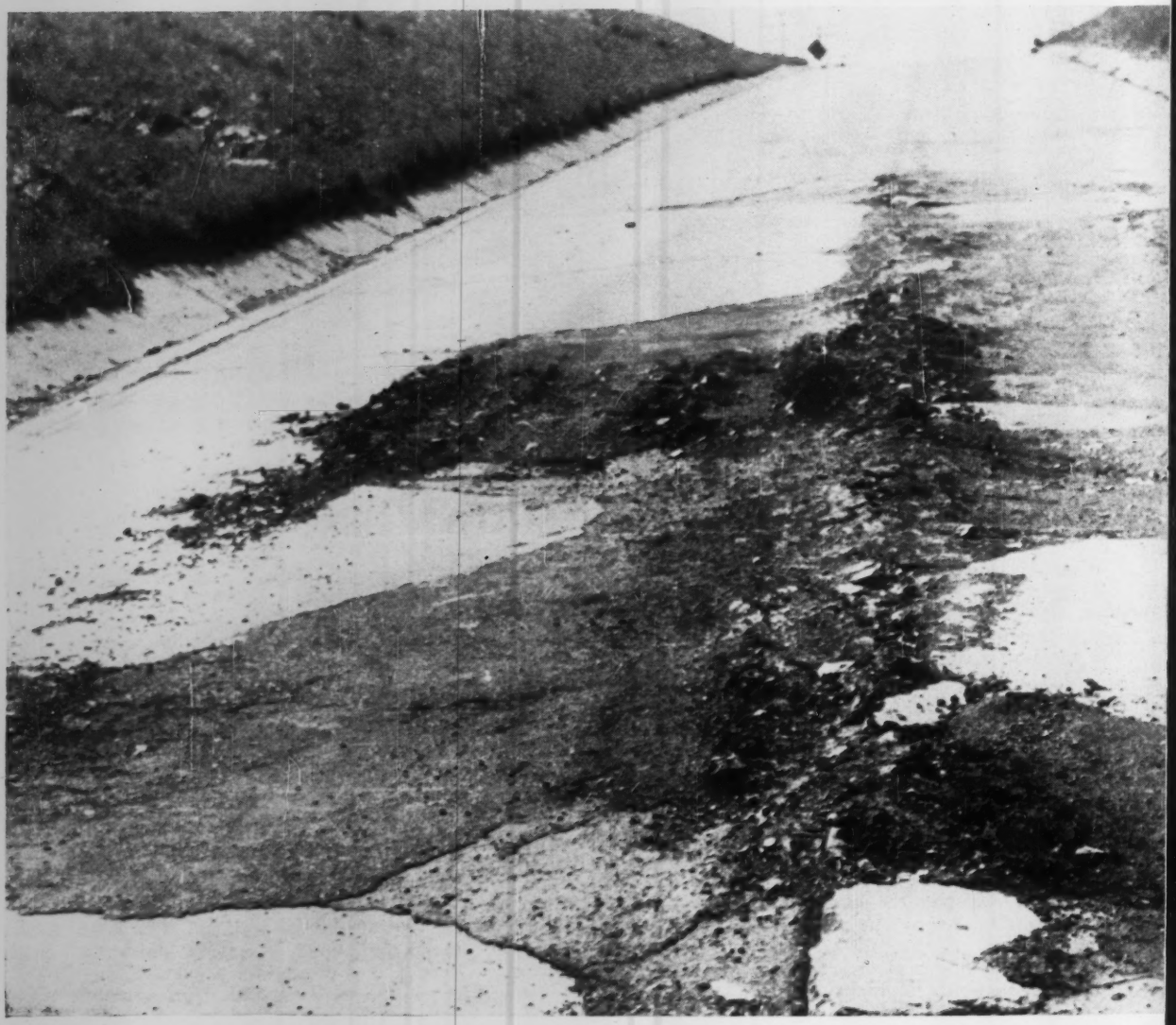

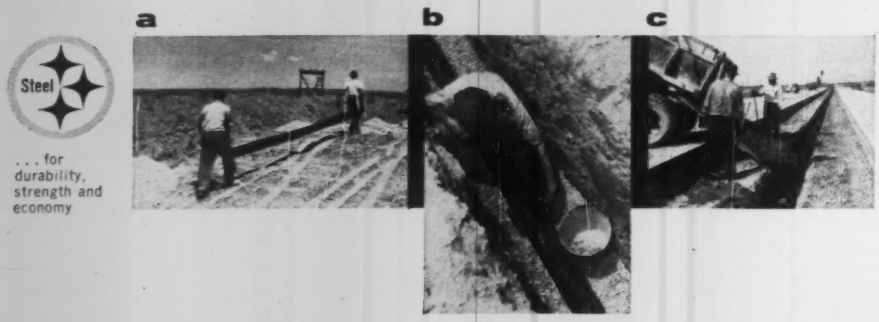

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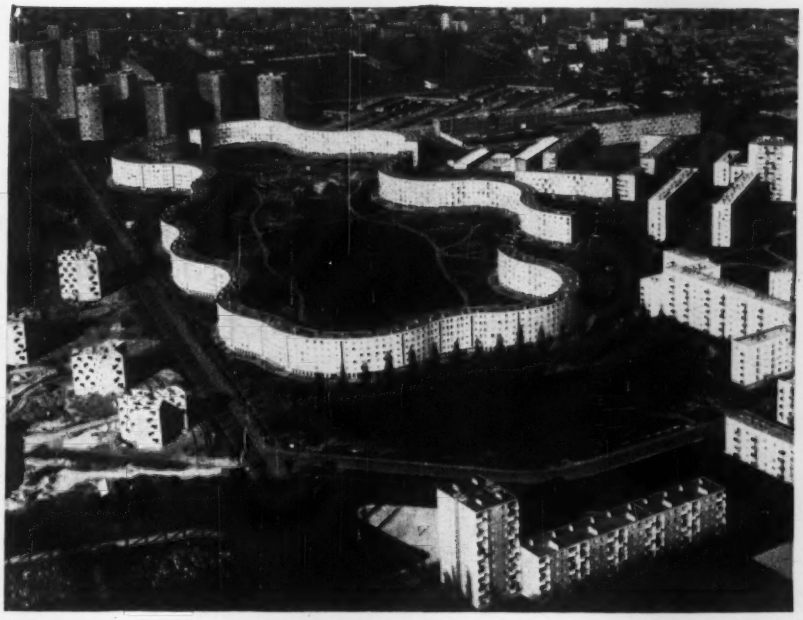
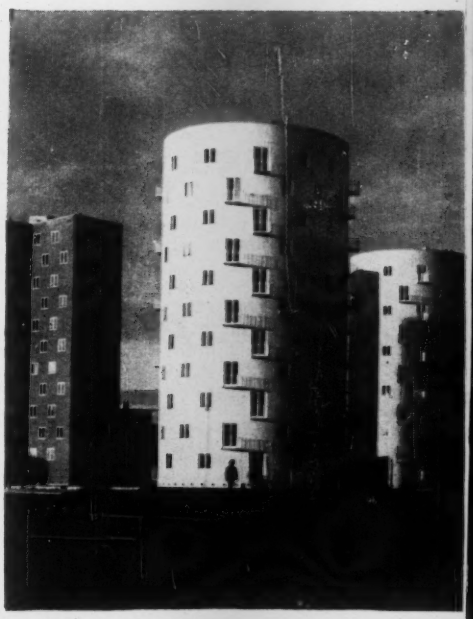


SERPENTINE APARTMENT HOUSE follows boundary of 13-acre park in a Paris suburb. The five-story building houses 800 families.



CIRCULAR TOWERS mark suburban Bobigny housing development.

French Housing: Vive la Différence

French architect Emile Aillaud has successfully defied the notion that low-cost housing must look like mass-produced boxes. For two grim industrial suburbs of Paris—Pantin and Bobigny—Architect Aillaud has designed large low-cost housing projects featuring unusual building shapes, gay colors and plenty of open space for parks and playgrounds.

At Pantin, Mr. Aillaud designed an apartment house whose serpentine plan preserves intact a 13-acre park; at Bobigny, he designed some cylindrical apartment towers to blend with other curved-wall buildings and more conventional Y-shaped structures.

Despite the unusual architecture of these buildings, Mr. Aillaud managed to qualify them as Logecos—the lowest-cost housing built in France. Both projects, les Courtillères at Pantin and Cité de l'Abreuvoir at Bobigny, also met the government limit on construction time. In fact, Mr. Aillaud claims that the uniformity of most low-cost housing is attributable more to the architect's lack of imagination than to economic factors.

The serpentine building at Pantin houses nearly 800 families in five stories of continuously-curving structure about two-thirds of a mile long. Structural elements consist of precast concrete slab and bearing-wall panels. Exterior walls are finished with mortar and coated with vinyl paint.

Panels for the plane wall surfaces of Y-shaped towers at Pantin have glazed tile facing and unusual patterns of metal window frames cast into them (see photo). The precast wall and floor panels also contain insulating materials and heating ducts.

Passages under the building at ground level provide access between the central park and a peripheral road bordered with parking space. Residential density, reduced by the plentiful open park space, is 29 dwellings per acre. This is close to the goal set by Philadelphia's master plan (ENR Oct. 13, 1959, p. 41).

The 11-story circular buildings at Bobigny contain three two-bedroom apartments per floor. Two elevators located in a shaft at the periphery stop at landings one-half flight above or below each floor.

Commercial development at Bobigny, like that at Pantin, is integrated with the residential space. Shops occupy the ground floor of the long apartment building. Tenants' storage space takes up the remainder of the enclosed ground floor space.

PRECAST WALLS in Y-shaped towers feature odd window patterns.

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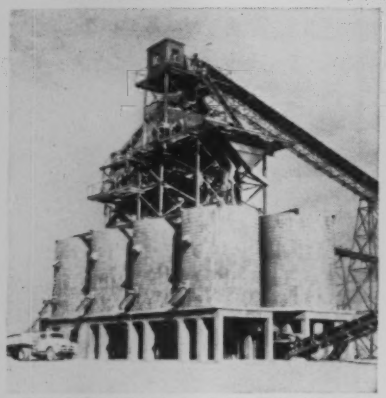

Standard Industries' new Tulsa production system is built around these Marietta silos.

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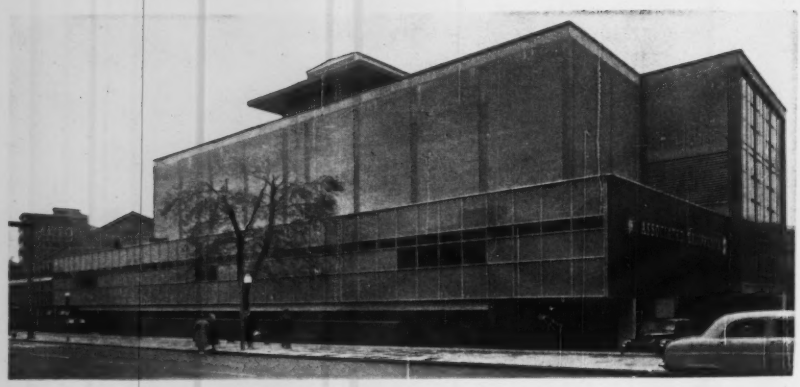


Giant London TV Studio Gets . . .

. . . Split in Half by 80-Ft Doors

A huge television studio—140 ft long by 100 ft wide witth a clear height of 40 ft—has been completed in London.

The architects of Associated-Rediffusion's Studio 5 designed the expanse so that it can be used alternatively as one studio or as two entirely separate areas.

Massive soundproof, vertically sliding doors divide the two sections. Each door is 80 ft wide, 35 ft deep and weighs 25 tons; each consists of two panels, about six ft apart and carried on a lattice framework. A panel is made of two sheets of steel with a 3-in. insulation core and acoustic-tile facing. The doors can be raised into a superstructure when the entire area is needed as one studio.

The building framework consists of concrete-encased steel columns and 100-ft span parallel steel trusses, 15 ft deep. Columns are set 16 ft apart, except for the center ones which are 8 ft apart and support the steelwork for the hanging doors. The superstructure above the doors rises to 20 ft above the 55-ft height of the rest of the studio.

Each half of the studio is structurally independent, to avoid sound interference, and has its own control room.

Transference of vibrations through foundations is avoided by concrete pads beneath each column. An average pad is 7 x 10 ft in plan by 7 ft deep.

To permit smooth passage of moving cameras, flooring was laid level with ⅛-in. tolerance. A 2-in. cork pad separates the two halves of the floor, and steel finger joints connect them at the surface. The floor consists of an 8-in. base of reinforced concrete, topped by ½ in. of asphalt, 2 in. of mastic screed and linoleum.

A varied arrangement of insulation and perforated wallboard in the walls, ceilings and movable partitions provides

(*Story continues p. 60*)

Goldendale School, Washington County, Wis. Architect: William P. Wenzler, Brookfield, Wis.

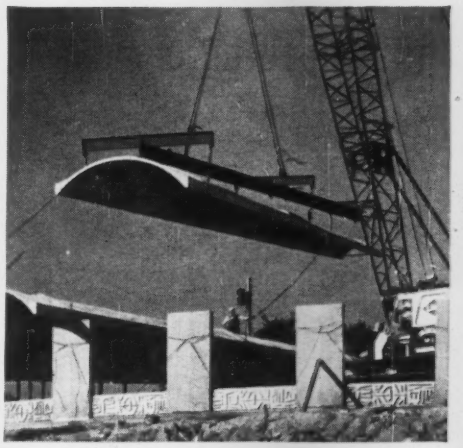
Circular-design school built entirely of concrete for less than $13.20 per square foot!

Near Germantown, Wisconsin, they've replaced the "little red schoolhouse" with a beautiful all-concrete structure of unique circular design. Housing three classrooms, this is the first unit of a projected 8-classroom primary school with auditorium-gymnasium.

The first unit was completed at a cost of less than $13.20 per sq. ft., including all service equipment for the full school. The completed building is expected to cost only $10.00 per square foot.

Concrete's inherent economies make modern design possible at reasonable cost. Thanks to precasting of shell roof elements, costs were reduced and construction speeded. Further economies resulted from the use of precast piers enhanced by the color and texture of exposed aggregate. Precast sculptured panels under the large windows added design interest at low cost. And interior walls are economical concrete block.

Once again, here's proof that where beauty, structural strength and fire-safety must be combined with economic realities—more and more architects and engineers turn to modern concrete construction. Write for free technical data on concrete shell roof design. (U.S. and Canada only.)



To effect circular design of building, precast concrete barrel roof shells are tapered. They are 57 ft. long, 12 ft. wide at one end, 5 ft. wide at other end. Shells are supported by precast piers.

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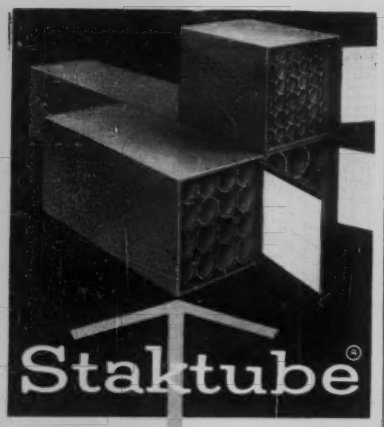

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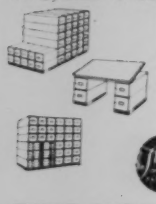

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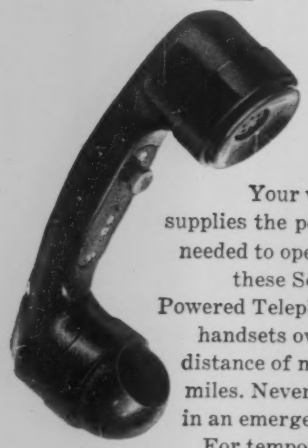

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acoustical control in the studio. "Stabilizer" panels of insulation and perforated wallboard also are suspended at various points between trusses.

Heating and ventilating equipment is housed in structurally separate extensions at each end of the studio. The building is not air conditioned. In the cool British climate, the designers considered it sufficient to ventilate with plenum systems. Large ducts pass through the truss openings. Adjustable nozzle drops push air down toward the studio floor and other high-level ducts extract warm air. The plenum systems also provide heat.

In the 15-ft-high roof space between the trusses, walkways lead to the lighting grids that are suspended 40 ft above the floor. The studio has 680 lighting circuits.

The facade of the building consists of glass and aluminum panels.

Architects were Farms & Partners. Andrews, Kent & Stone were structural engineers. The prime contractor was Bovis, Ltd. The giant doors were designed, built and installed by George W. King of Stevenage, Hertfordshire.

Associated-Rediffusion Ltd. is a contractor for Britain's commercial TV network.

Unknown Bridge Took Know-How

The first major bridge in Labrador—a 280-ft steel cantilevered suspended span over the turbulent and rocky Unknown River—took only 19 days to erect with a maximum work force of 14 men.

The bridge is located in a wild and remote area 112 miles from the nearest railhead. Its function is to carry a 14-ft-wide access road over the river to the main power house site of the Twin Falls hydroelectric development (ENR June 30, 1960, p. 43).

Engineers designed the bridge for heavy tractor trailers and other mobile equipment to 100-ton gross weight. Preliminary inspection of the site dictated design of the bridge with no river piers, since depth of the 220-ft-wide river exceeds 40 ft in the most favorable location and velocity of the water ranges up to 15 ft per second.

Wind loads are high in this region of Canada. Designers developed special wind locks in the abutments and in the connections between the cantilever sections and the suspended span. They also designed special shear connections at the main bearings to take care of wind reactions.

All three principal structural elements of the bridge—anchor arms, cantilever arms and suspended span—are twin riveted plate girders with necessary stiffeners and bracing. Girders are about 15 ft deep over the piers and 8 ft deep in the suspended span. Field connections are bolted. Anchor arms are 30 ft long; cantilever arms, 60 ft; and the suspended span 100 ft.

The contractor brought some equipment in by helicopter during the late winter to take advantage of ice landings before the spring break-up. Remaining equipment and supplies were shipped by boat to Sept Iles, on the Gulf of St. Lawrence; transferred to the Quebec, North Shore and Labrador Railroad and brought to Esker. Tractor trailers were used to transport the material the remaining 112 miles to the Unknown River.

In June, Labrador's "spring," bulldozers entered the area and started clearing the site. The abutments and piers rest on granite outcroppings. The abutments are anchored by steel dowels drilled from 15 to 20 ft into the granite.

By the end of July, workmen had built the pier and abutment forms and were placing 3,500-psi concrete from a ¼-cu-yd mixer.

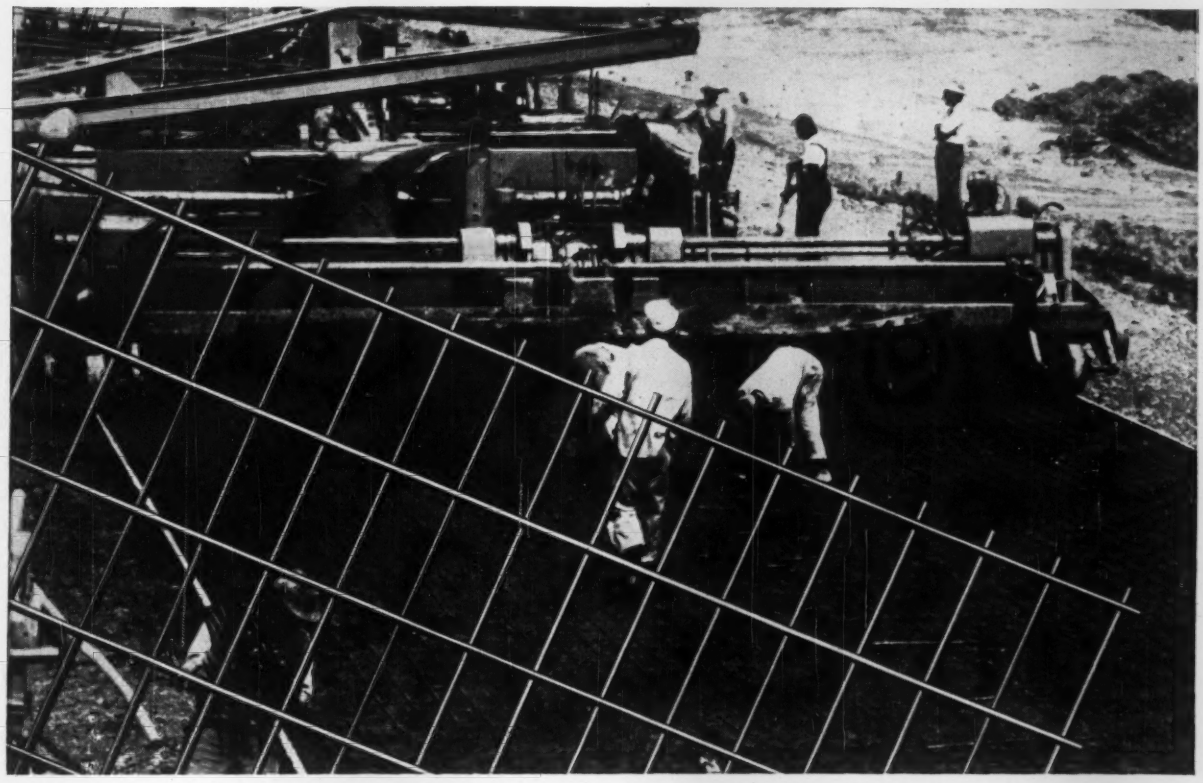
Dominion Bridge Co's erecting crew arrived at the site early in September. First step was to erect the anchor arm on one side of river; then came the 60-ft cantilever section on that side. Two sections were decked with laminated timber.

A 40-ton crane then swung one-half of the 100-ft suspended span into place. Steelworkers made temporary connections and installed blocking to hold the outer end of the section about 3 in. above its final position.

Workers partially dismantled the crane, loaded it on a scow and moved it to the other side of the river. Disassembly, crossing the river and reassembly of the crane took four days. Erection procedure was repeated for the other half of the bridge.

After the center splice had been made, the contractor lifted the entire suspended span enough to remove its temporary supports. The span then was lowered gently to rest on laminated steel and rubber bearings on the cantilever arms. Bearings of this type were also used between the anchor arms and the underside of abutment tops. Main pier bearings are conventional rockers.

Shawinigan Engineering Co., Ltd. designed the bridge and did the concrete work; R. H. Carrier was project manager.



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to strengthen concrete construction

Clinton Welded Wire Fabric

For years, CF&I has worked closely with the construction industry, developing strong welded steel mesh for reinforcing purposes. The result: CF&I-Clinton Welded Wire Fabric.

This rugged mesh gives concrete structures—from bridges and roads to culverts and skyscrapers—maximum strength and durability. Its dependability stems from the high quality of the steel wire used.

CF&I-Clinton Welded Wire Fabric is manufactured to all ASTM specifications and is furnished in either rolls or mats. It is supplied in a wide range of gages and spacings. For complete information, call our nearest sales office.

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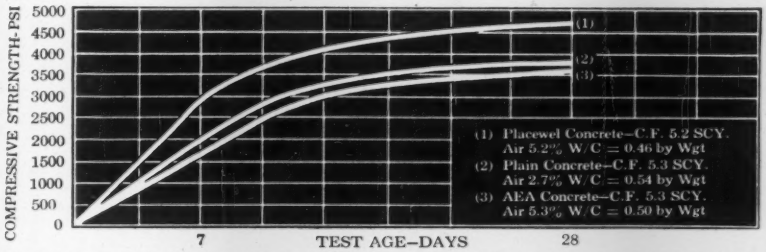
Increase concrete strength 30% with J-M Placewel...

the liquid admixture that gives you 5 key controls of concrete

Placewel®, a product of Johns-Manville, world's largest industrial user of portland cement, permits a new high in compressive and flexural strength. This superiority has been proved in millions of yards of concrete.

Placewel is a water-reducing, dispersing agent *plus* a catalyst. It is available with or without an air entraining agent. Placewel, by breaking up the cement flocs, releases water for lubrication that isn't normally available. Thus, mixing water requirements are cut without relying on air entrainment alone. The Placewel catalyst enhances the strength-gaining characteristics of portland cement. This unique combination of properties provides a 30% increase in concrete strength (see chart).



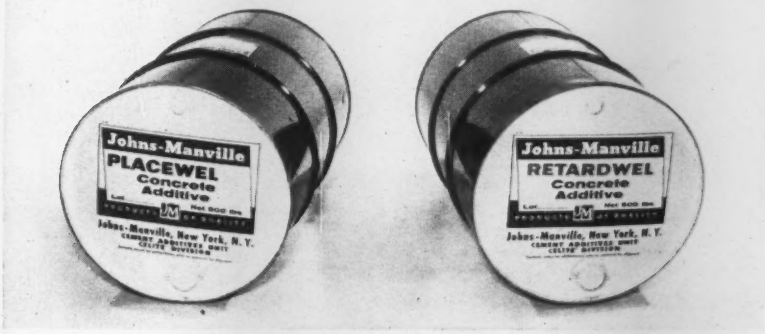
Compressive strength – performance of Placewel vs. plain and air entrained concrete

Less than three ounces of Placewel per sack of cement will also –

- Increase durability 350%
- Improve dimensional stability
- Increase workability
- Reduce permeability

J-M Retardwel® is recommended when concreting conditions require longer placing and finishing time. Retardwel delays the initial set of concrete and yet provides higher 24 hour strength.

Architects and engineers the world over have learned that Placewel and Retardwel give them complete control over the concrete they specify. For full information and technical assistance write: Johns-Manville, Box 14, New York 16, N. Y.



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Celite Division

How to Figure Steel Weight in Bridges

By Henson K. Stephenson

Engineers and contractors can use data in graphical form to determine minimum weights of steel in highway bridges. Such information is useful in estimating the dead load to be used in designing such bridges and in determining the weights of steel required for estimating construction costs.

The chart gives the minimum weights of steel per sq ft of roadway required for interior stringers in simple span bridges of various lengths and loading designs based on the use of rolled beams or welded plate girders. These weights include no allowance for beam supports, such as bearing plates or rockers, but do include a small allowance for diaphragms or lateral bracing.

The minimum steel weights indicated are those required for bridges consisting of a 6-in. non-composite concrete deck supported by steel stringers, designed according to the 1953 AASHO (American Association of State Highway Officials) Standard Specifications for Highway Bridges. However, if the design is made according to the 1957 AASHO Specifications, the minimum steel weights will be about 6% less than those given in the chart. The steel weights indicated also may be adjusted for variations in thickness of the concrete deck. For example, an increase in thickness of the deck from 6 to 7 in. will result in increases in the indicated steel weights varying from about 3% for the shorter spans to about 5% for the longer spans.

For purposes of either estimating or design, it may be assumed for any given steel beam bridge that the exterior stringers will be the same size and weight as indicated by the chart for the interior stringers. Although the exterior stringers in certain cases may weigh a little less than the interior ones, the difference would ordinarily be so small as to have but little, if any, influence on a given design or estimate.

The following examples illustrate use of the data:

Example 1: A two-lane, 50-ft beam bridge (49.0 ft c-c supports) designed for an H15 loading according to the 1953 AASHO Specifications is to consist of a 6-in. concrete deck supported by two inside and two outside steel stringers spaced at 8.0 ft on centers. It is desired to know the minimum weight of steel required for each interior stringer. For this case the chart shows the steel weight to be 15.5 psf of roadway tributary to each interior stringer. The minimum steel required would be 15.5 x 8.0 = 124.0 lb per ft; or a total weight of 124.0 x 50.0 = 6,200 lb for each interior stringer.

Example 2: For the two-lane, 50-ft bridge of H15 design described in Example 1, suppose it is desired to know the total weight of steel required for the four supporting stringers. Since each outside stringer will weigh about the same as each interior stringer, the total weight required for all four stringers would be about 4 x 6,200 = 24,800 lb.

Example 3: For the two-lane, 50-ft bridge described in Example 1, suppose it is desired to know how much additional cost would be involved for the superstructure if the bridge were designed for H20 instead of H15 loading. For the H20 loading and a 49.0-ft span, the chart shows the interior stringer weight to be 18.2 psf of roadway tributary to each interior stringer. Therefore, each interior stringer would weigh 18.2 x 8.0 x 50 = 7,280 lb; or a total weight of 4 x 7,280 = 29,120 lb for the four stringers. This represents an increase of 29,120 − 24,800 = 4,320 lb. If the unit cost of steel in place is assumed to be 15 cents per lb, the increase in cost of the H20 as compared with the H15 design would be about 4,320 x 0.15 = $648.00.

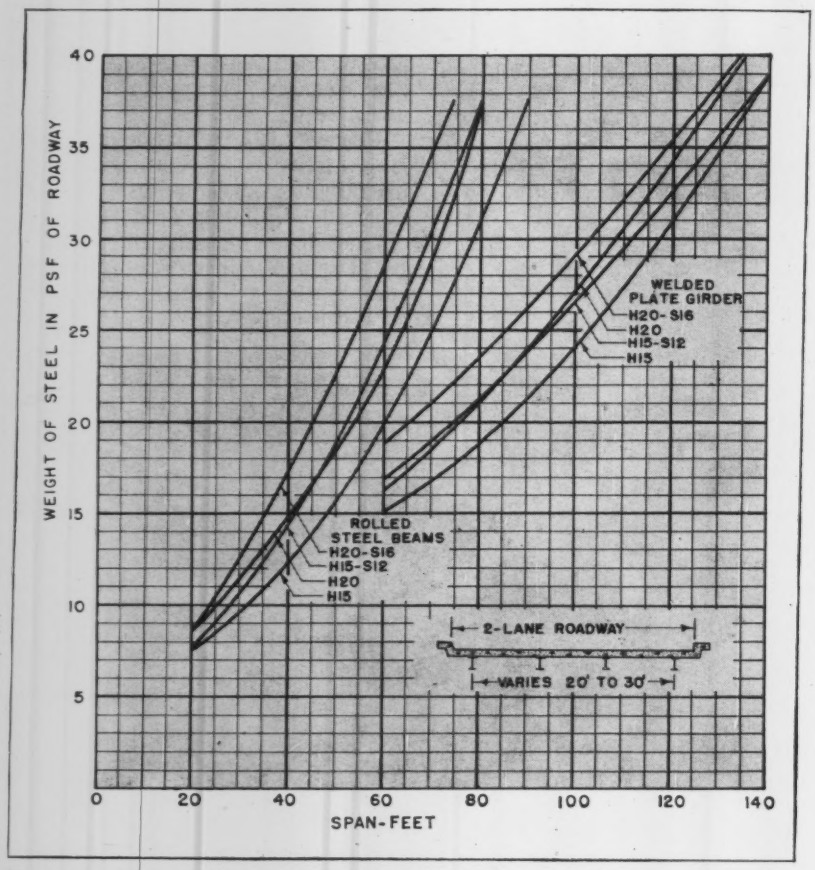
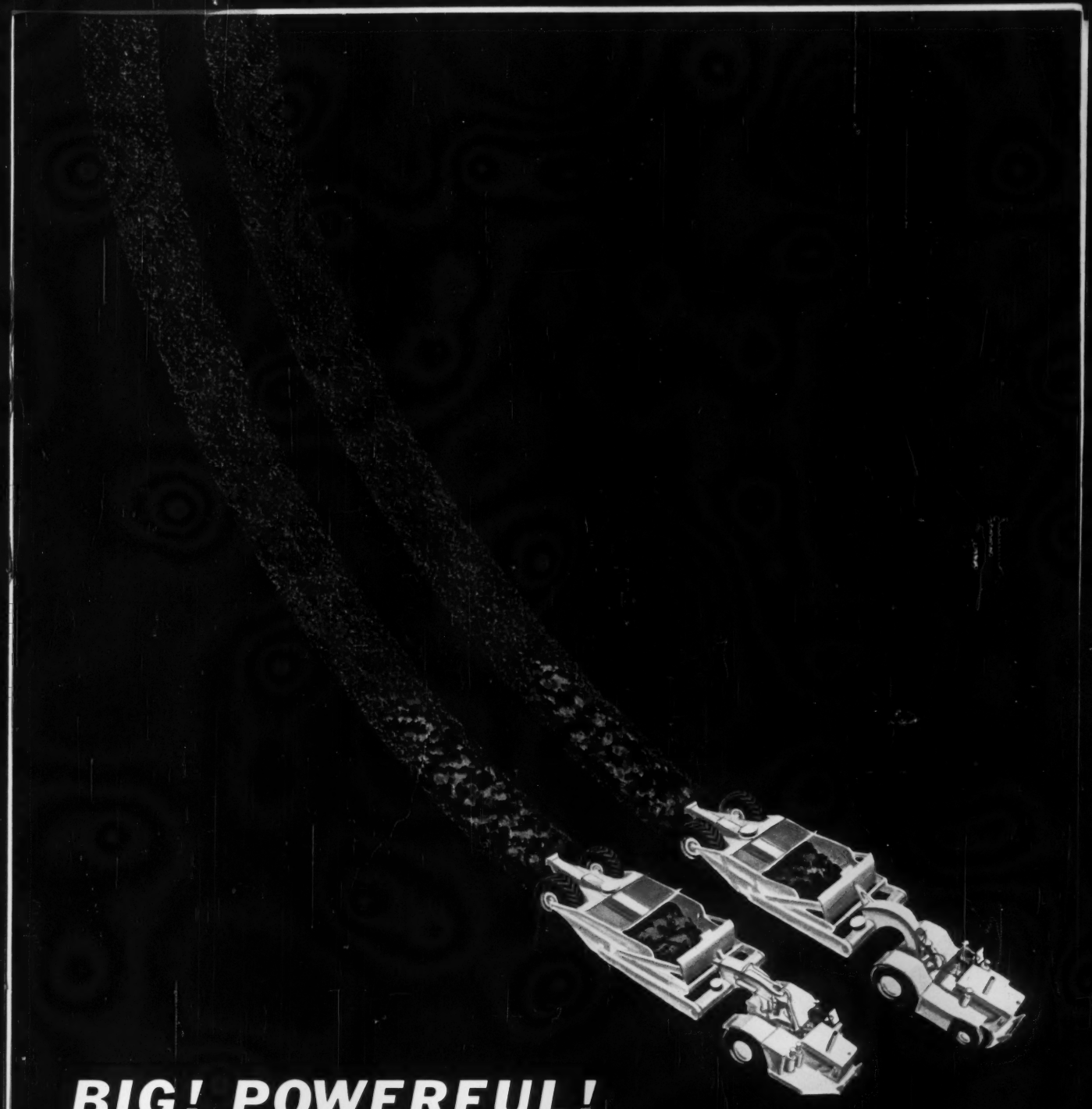


CHART gives minimum weight of steel in highway bridges and aids in estimating design dead loads and construction costs.

Texas A&M's H. K. Stephenson has been research engineer and professor of civil engineering at that institution since 1943. He is a specialist in highway bridge loadings and design.



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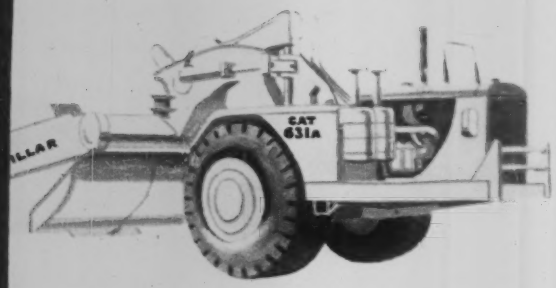
NEW CAT 630 AND 631!

A new concept in power shift transmission coupled with a new 420 HP engine...

plus other new developments . . . provides the last word in operating, service and maintenance ease and economy. The four-wheel 630 and two-wheel 631 join the widely accepted DW20, DW21 and 619 to give you an even broader choice of wheel tractor-scrapers from Caterpillar. For more facts, see the following pages. For complete proof on your job, ask your Caterpillar Dealer!



New CAT 630 and 631

Now power is put to real work with a combination of new concept in power shift transmission and all-new engine—designed and teamed to fit the power to working conditions. This tailored power train, together with unit construction, greater scraper capacity, air-actuated cable control, and new tires makes the 630 and 631 the ultimate in wheel tractor-scraper design!

POWER SHIFT TRANSMISSION

9 speeds with just 3 shifts. This new concept in power shift transmission automatically adjusts the machine to job conditions. Key to this system is a unit mounted directly behind the engine, which combines a planetary gear set with a torque converter so as to provide power to the three speed-range transmission on the rear of the main frame, in one of three ways: (a) torque divider drive (a combination of 75% direct, 25% torque converter); (b) direct drive; (c) overdrive. Result: nine different speed variations—*but* the operator need only concern himself with the three speed ranges controlled by his one lever. (A safety latch prevents accidental engagement.) The rest is completely automatic, governed by a simple mechanical-hydraulic system. Here's how it works:

Operator moves the lever to position *1*, first range, to start the machine down haul road. The machine is now in torque divider drive for easy start and greatest rimpull. As speed increases, converter is no longer required, so the transmission shifts *automatically* to direct drive. When haul conditions permit, the transmission automatically shifts to overdrive.

As speed increases, the shift indicator dial shows operator when to shift to second speed range, *2*. Again the transmission automatically goes into torque divider drive and smoothly picks up the load. As before, when conditions permit, it automatically shifts to direct drive and then to overdrive. This same cycle can be repeated in third range.

Downshifting is automatic too. As transmission senses increasing power needs, it shifts down from overdrive to direct drive to torque divider drive. When conditions require it, the indicator will tell operator when to select the next lower speed range.

Once back in the cut, operator shifts to load position, *L*. This locks the transmission in torque divider drive of the first speed range.

That's Caterpillar's new concept in power shift transmission, designed specifically for these new machines . . . designed to make them more efficient by making the operator's job easier.

ALL-NEW 420 HP CAT ENGINE TAILORED TO POWER NEEDS

Designed for the 630 and 631, this six-cylinder, 5.4″ bore x 6.5″ stroke D343 Engine is turbocharged and aftercooled. It develops 420 HP maximum (335 HP at the flywheel).

Typical of the newness is head design. The engine is parallel ported with dual intake and exhaust valves for most efficient air system. The overhead camshafts eliminate rocker arms and push rods. And the new shelf head design results in fast coolant circulation for outstanding heat dissipation.

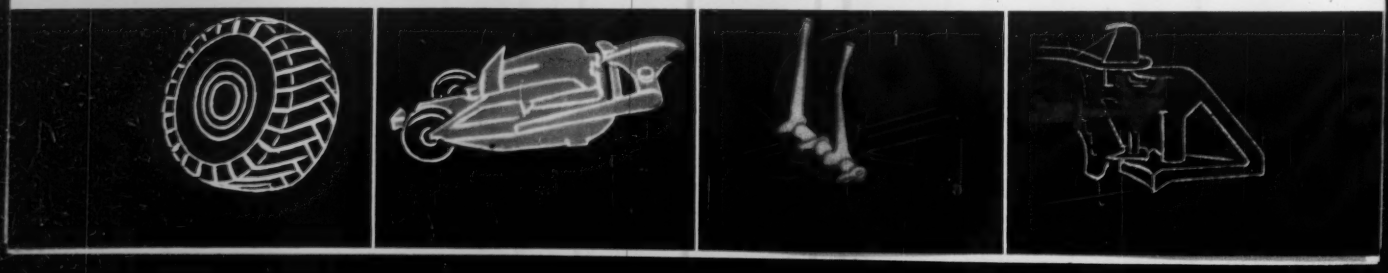
Besides these and other new features, the engine offers the economies of the proven Cat fuel system with precombustion chamber . . . burns No. 2 fuel oil—premium diesel fuel not required . . . pressure ratio controlled turbocharger for optimum air flow throughout the engine operating range . . . aftercooler for greater air density for more complete combustion.

New 29.5 x 35 Tires. This all-new tire size was originally developed for the 630 and 631, to provide the best combination of size, capacity and rideability at the lowest cost per yard. These tires were job-proven by tough tests.

New Scrapers. Matching 28 cu. yd. heaped (21 cu. yd. struck) scrapers feature increased capacity, better loading. Sheave bearings now have 125-hour lubrication period. Other trailed units are also available.

New Cable Control. Live power provides control whenever the engine is running. Air-actuated controls cut operator effort in half, retain "feel" of control. Improved cable savers prevent breakage due to double-blocking.

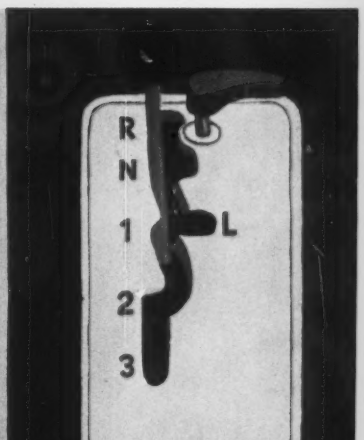
Improved Steering. New two-jack steering makes the 631 easy to maneuver, yet retains "feel" of the road. Improved steering for the 630 absorbs shocks outside the steering gear, provides easier handling in tight quarters.



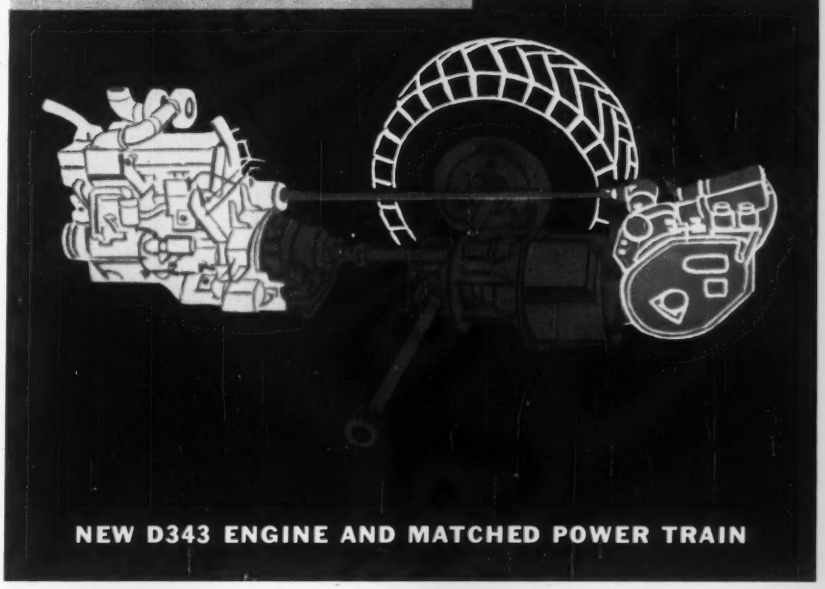
match power to job conditions—automatically!

3 SHIFTS—9 SPEEDS

SHIFT INDICATOR



SPEED RANGE CONTROL



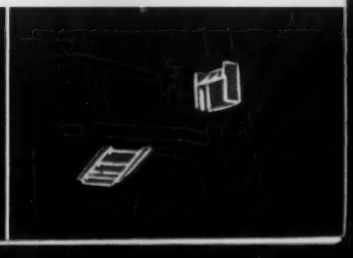
NEW D343 ENGINE AND MATCHED POWER TRAIN

FULL UNIT CONSTRUCTION—EASIER SERVICING

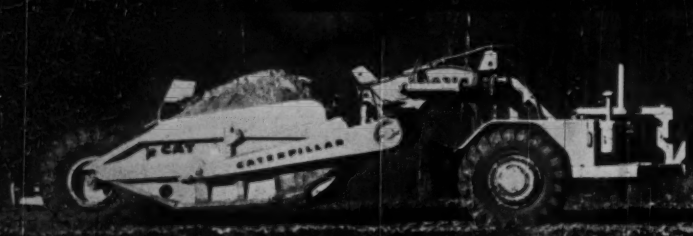
Transmission Units. Range transmission is case mounted for accessibility, can be removed as a unit with cable control and differential carrier. Another timesaver: torque divider transmission is removable as a unit without disturbing the engine. Transmission control units are accessible without disturbing the transmissions.

New Radiator-Fan Unit. Fan is shroud-mounted on the radiator for more efficient cooling. Now radiator, side plates and fan can be removed as a unit for servicing—or to provide easy access to the front of the engine.

Servicing Timesavers. Dash swings to expose side of 631's engine. Crankcase guard pivots for access to bottom of engine. For easy tire removal, fenders tip forward on 630, are easily removable on 631.



CAT WHEEL TRACTOR-SCRAPERS MATCH THE JOB!



High producers on adverse grades, soft going and close quarters

NEW 631	DW21	619
420 HP (Maximum Output) Power Shift Transmission	345 HP (Maximum Output) 5-speed Constant Mesh Transmission	225 HP (Maximum Output) 6-speed Constant Mesh Transmission
31.2 MPH	22.6 MPH	30.2 MPH
28 cu. yd. heaped (21 cu. yd. struck)	27 cu. yd. heaped (19.5 cu. yd. struck)	18 cu. yd. heaped (14 cu. yd. struck)

High producers on long hauls

NEW 630	DW20
420 HP (Maximum Output) Power Shift Transmission	345 HP (Maximum Output) 10-speed Constant Mesh Transmission
41.5 MPH	35.8 MPH
28 cu. yd. heaped (21 cu. yd. struck)	27 cu. yd. heaped (19.5 cu. yd. struck)
Optional 482 Series C Scraper 35 cu. yd. heaped (27 cu. yd. struck)	

For more complete information about new Cat Wheel Tractor-Scrapers, ask your Caterpillar Dealer.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

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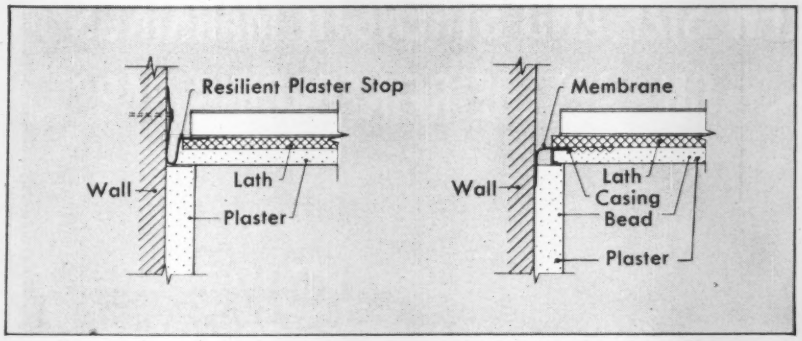
—CERTAIN AS YESTERDAY



Two ways of limiting perimeter restraint of plaster show . . .

How to Reduce Ceiling Cracks

Plaster ceilings with unrestrained perimeters are more resistant to cracking than ceilings with restrained perimeters. That is the conclusion of researchers of the Gypsum Association after conducting a seven-year program investigating the performance of lath and plaster ceiling systems.

The test results also show that crack resistance of gypsum lath is superior to that of metal lath for smooth-troweled plaster ceilings. Float-finished ceilings, however, performed about equally well for both types of lath.

The "laboratory" for the experiment comprised three large hospital projects, carefully selected for similarity in construction and room size. Plaster, with a few exceptions, conformed to ASA Standard Specifications A42.1 and A42.4 for Gypsum Plastering and Interior Lathing and Furring.

Performance rating scale set 10 for top performance in crack resistance and 0 for the most extensive cracking encountered. On this scale, performance ratings showed ceilings with unrestrained perimeters earning a rating of 9.0 and those with restrained perimeters, 6.6. Other variables were held constant for making these comparisons.

To prevent cracking in large unbroken ceiling areas, the Gypsum Association's report recommends a maximum distance of 60 ft between relief joints and a maximum undivided area of 2,400 sq ft.

Two-thirds of the 186 ceilings studied were finished with gypsum gaging-lime trowel finish; most of the remainder were finished with Keene's cement-lime putty, sand float finish. The latter performed best, in all cases earning a rating of 10 on the performance rating scale. They developed an average of less than 5 in. of cracking per ceiling. The ceilings finished with the gypsum gaging-lime trowel finish earned an average performance rating of 8.2.

The Contracting Plasterers & Lathers International Association in a recent set of recommendations approved by four other trade groups differs with the Gypsum Association's findings on perimeter restraint. The CPLIA says that elimination of perimeter restraint is necessary only under conditions of extreme temperature change or excessive vibration.

Traffic Pacer Matches Speed Signs With Lights

Traffic will be "paced" in Warren, Mich., by signs that tell motorists what speed will bring them to the next traffic signal while it is green. General Motors Research Laboratories and the Macomb County (Mich.) Road Commission will install the "Traffic Pacer" on a four-mile stretch of arterial street in the Detroit suburb. The system is a two-year experiment.

The Traffic Pacer is based on the German version of a "traffic funnel" developed by Wolfgang von Stein. The method is now extensively used in Dusseldorf and Cologne, West Germany. Results in Germany have been reported as an increase in traffic capacity of as much as 20%, fewer stops for motorists and improved safety.

Idea of the system is to concentrate cars moving in a traffic lane into groups timed to arrive at signalized intersections during the green interval. Concentration is accomplished by an illuminated speed sign located just beyond each intersection in the system.

The indicated speed on the sign varies with the position of the car in the group or its time of passing the sign. The system is designed to be flexible in operation to fit varying traffic conditions during any one day.

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3 Standard Types

Servicised Dumbbell design waterstops provide a positive, elastic barrier against leakage resulting from hydrostatic pressures. Dumbbell design assures positive sealing action because, as the concrete contracts and opens the joint, the outer anchoring bulbs of the waterstop become more tightly engaged with the concrete. Servicised Polyvinyl Plastic Waterstop will withstand lateral movement without impairing its water sealing properties.

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Rubber waterstops are made of a durable, elastic cured rubber compound capable of withstanding considerable movement and both horizontal and vertical shear stresses to insure optimum sealing of joints subjected to hydrostatic pressure. Widely specified and used in installations requiring positive joint sealing.

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Dumbbell design waterstops have been successfully used for over 35 years in major public works structures where heavy hydrostatic pressures have existed.

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Pick up any Laclede Multirib reinforcing bar. A rolled-in marking immediately tells you its size, strength and manufacturer. Laclede Multirib bars of high strength steel are rolled to conform to the two new ASTM standards: A-432 for 60,000 psi minimum yield point steel, and A-431 for 75,000 psi minimum yield. These bars can be used with assurance under the Ultimate Strength design methods included in the new A.C.I. building code. Bars of either 60,000 or 75,000 psi yield strength are identified by one and two longitudinal ribs, respectively.

These high-strength steels can contribute a saving of as much as 15% in the total construction cost of a concrete structure. The worker in the field can quickly find the right bar specified for the job; with the grade of steel well identified, many inspection and laboratory test charges may be eliminated.

For your next construction job, specify these time-saving, money-saving Laclede Multirib reinforcing bars.

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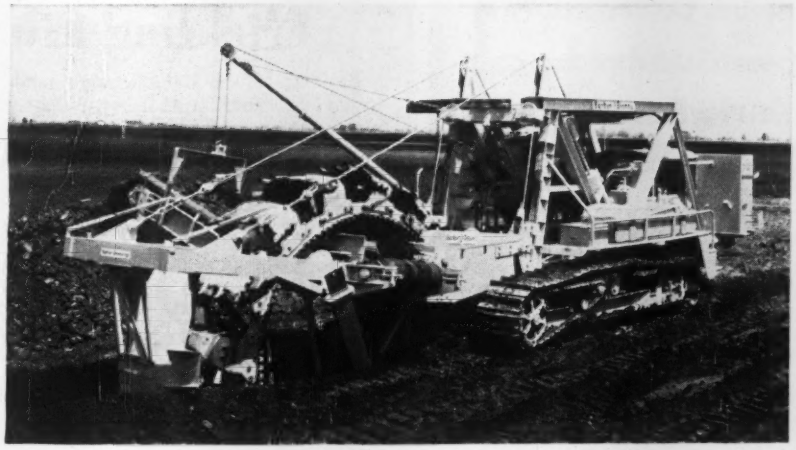

Trencher Digs Deep and Wide

Barber-Greene calls its Model 777 ditcher the most powerful crawler-wheel ditcher ever made by a margin of 40%. The machine can dig a trench 8½ ft deep and 4½ ft wide—or 9 ft. wide at the top by using slopers.

The ditcher has performed well on 30- to 35-deg slopes with enough reserve power to spin its tracks in sandy patches.

Each track has independent hydraulic drive. The maker's "Hydra-Crowd" mechanism is said to give the operator full-time power steering with one-lever control while digging on the straightaway, and permit crowding speeds from zero to 33 fpm. The mechanism also allows the machine to turn around within its own length.

All machine operating functions—crowding speeds, transmission speeds, wheel speeds, wheel hoist, etc.—are independent of each other. To make life easier for the operator, controls are grouped according to function.

The digging wheel, however, is driven mechanically by short, completely housed drive chains and is supported by flexible drawbars that permit the operator to dig sidebends without repositioning the ditcher. A dual-drive is also provided. Although the wheel hoist is hydraulically controlled, the mechanical digging transmission is completely independent of hydraulically controlled crowding speeds.

The spoil conveyor on the Model 777 runs at belt speeds up to 1,000 fpm, so that ditcher production is never held up because material isn't discharged fast enough.

Getting the ditcher to and from the job site can be done easily without dismantling because the ditcher can mount a conventional lowboy trailer under its own power.

Crawlers are mounted on special three-point suspension and are extendible outboard of their normal positions to provide greater lateral stability and to accommodate wider-than-normal crawler pads where additional flotation is needed. BARBER-GREENE CO., 400 NO. HIGHLAND AVE., AURORA, ILL.

...This One Comes with 3 Booms

A crawler-type trencher and backfiller, called the Model C Davis T-66, digs trenches from 1 ft wide by 2½ ft deep to 3 or 4 in. wide by 5½ ft deep.

Ground pressure of the self-cleaning track shoes is said to be just over 500 psf. Both tracks are of equal length.

The digging boom is hydraulically operated. Interchangeable booms are available in three lengths—40 in., 54 in. and 66 in. Digging teeth are made of high carbon steel.

Trenches from 3 in. to 6 in. wide are handled by standard tooth and spacer set, but teeth are also available in 8-in., 10-in. and 12-in. widths.

The transmission has instant reversal, cutting out intermediate gear shifting, the maker says. The machine also has individual left and right steering brakes.

Backfilling is done by a 42-in. blade that can be set straight or angled to the left. The blade has hydraulic bite control. One man can install it.

Digging speeds are 1 to 12 fpm; backfilling and transport speed is about 2 mph. DAVIS MANUFACTURING CO., 1500 SOUTH MCLEAN BLVD., WICHITA 13, KAN.

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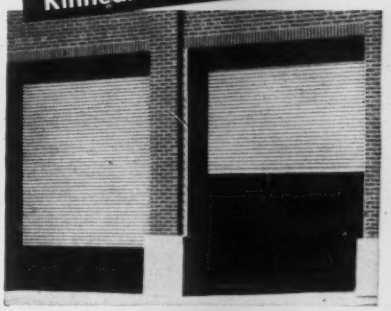

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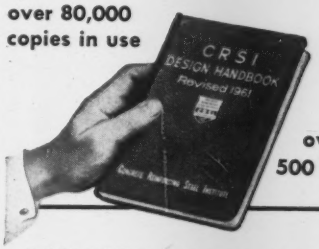

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To speed up forming—and the entire job—use SONOTUBE Fibre Forms for all types of round concrete columns and piers.

Lightweight and easy to handle, these forms can be quickly placed by semi-skilled labor. And, since a SONOTUBE Fibre Form is one-piece, cut to correct length, there's no bolting, nailing, or piecing required. With these one-time-use forms, any number of columns can be poured at one time—thus eliminating many of the delays usually experienced when a limited number of permanent-type forms are used.

SONOTUBE Fibre Forms save time, labor, and money in other ways too. Saw them for tie-in with beam forms, punch them for dowel rods or anchor bolts, cut them for utility outlets. No other type form provides such simplicity of "custom cutting" at the job.

When there are round concrete columns to be formed, use the faster, more economical method—Sonoco SONOTUBE Fibre Forms. There's a type to meet *your* job requirements—in sizes from 2" to 48" I.D., standard 18' lengths or specified lengths.

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. . . New Products

Trickling Filter

Bio-Pac, Link-Belt Company's name for its latest addition to a line of sewage plant equipment, is a packaged, two-stage trickling filter plant that is a miniature version of those used by many large cities.

Designed in accordance with the "Ten States Standards for Sewage Works," the units are reported to remove 85 to 95% of the organic materials in the sewage. The system maintains a stable effluent under adverse conditions, and, according to the maker, readily absorbs shock loads.

Entirely automatic, Bio-Pac is easy to maintain, requiring only part-time care by one person, who need not be highly trained, the maker says.

Eight sizes are available to serve populations from 50 to 500. Per capita costs of the unit range from $60 for the largest unit to $240 for the smallest. Costs include Bio-Pac and appurtenances, installation, external plumbing, wiring and all field work, but exclude sewers.

Units for up to 200 people are factory assembled; others are assembled in convenient sections for easy field assembly. The smallest, built for 50 people and a flow of 5,000 gallons a day is 8 ft in diameter and about 22 ft high. The largest, for 500 people and a flow of 50,000 gallons a day, is 18 ft in diameter and some 30 ft high.

Operation is simple. Raw sewage flows by gravity or is pumped to a primary compartment for the first stage of gravity separation. The resulting effluent is then pumped to the primary filter for initial exposure to bacterial action. Then, the primary filter effluent is divided into two portions. One portion is recirculated to the primary settling compartment; the other is pumped to the secondary filter.

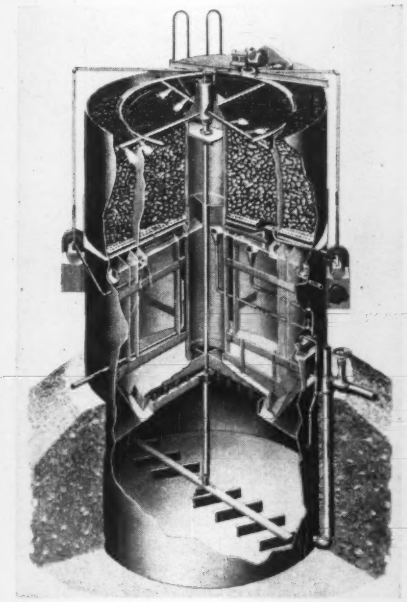
Effluent from the secondary filter is put through the final settling compart-

Radiation Gages

Controlling the density of sludge in a sewage treatment plant is done automatically by a Sludge Reader, its maker states.

The Sludge Reader uses a low-energy radiation source to pass radiation through the pipe. Variations in the sludge density cause variations in the nuclear beam given off by the source. A detector receives the nuclear beam and passes it on to a computing circuit that energizes the sludge pump controls. The instrument reacts to changes in solids concentration passing through

in a Package



Cutaway shows plant's simplicity.

ment where flow is again divided—one portion to the secondary filter and the other to the receiving stream. Sludge from both primary and final settling compartments goes into the digester. Digested sludge can be disposed of on drying beds or hauled away by truck.

A prototype of the Bio-Pac designed for 150 persons has been in operation on a 24-hour-a-day basis for over a year at Link-Belt's Colmar, Pa. plant. Operating results showed that with an average BOD (biochemical oxygen demand) of 250 ppm and suspended solids of 200-250 ppm in the raw sewage, reduction to an average of 30 ppm BOD and 30 ppm suspended solids is obtained. LINK-BELT COMPANY, PRUDENTIAL PLAZA, CHICAGO 1, ILL.

Sludge Density

the line. At a preset level, it controls the sludge pump.

If, for example, you want to pump sludge having a consistency of 4% or more, the sludge reader is set to stop the plunger pump when sludge consistency gets below 4%. It restarts the pump and keeps it running when the sludge consistency reaches and maintains 4%. The unit is designed to operate over a wide range of temperature, line voltage and other operational variables. KOMLINE-SANDERSON ENGINEERING CORP., PEAPACK, N. J.

SONOCO offers Economy of Choice in Round Column Forms

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FIBRE FORMS
for round columns of concrete

When there are round concrete columns to be formed, you'll get greatest economy by using SONOTUBE Fibre Forms. One reason for this is *choice—only Sonoco* offers FIVE types of "job-suited" round concrete column forms. This wide choice permits you to select the one SONOTUBE type that will fulfill specific job requirements best . . . at the lowest possible cost:

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2. For extra-smooth finished columns, use Seamless SONOTUBE Fibre Forms.
3. For unfinished or unexposed columns, use "W" Coated SONOTUBE Fibre Forms.
4. For encasing existing posts, piles, utility lines, etc., with concrete, use SONOTUBE Encasement Forms.
5. For columns to be formed in water or excessive dampness, use Special SONOTUBE Fibre Forms.

In addition to job-suited economy, *all* SONOTUBE Fibre Forms save time, labor, and money on the job. They are low-cost, lightweight, and place, brace, pour, and strip quicker. For the fastest, most economical forming of round concrete columns, order SONOTUBE Fibre Forms . . . available 2" to 48" I.D., standard 18' lengths or as required. Can be sawed.

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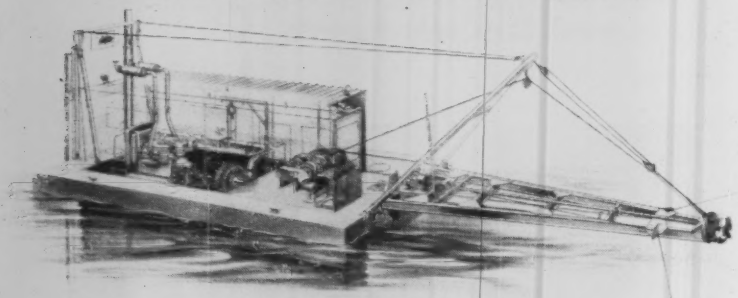

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6. "DRAGONS" which comprise over half of Ellicott's total dredge production are working throughout the world on road construction, land reclamation, industrial anti-pollution and waterway maintenance programs. These are only a small sampling of the projects on which "DRAGON" versatility has been demonstrated.

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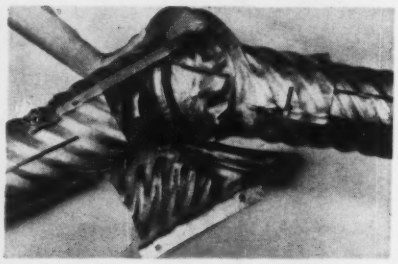

Universal Joint for Pipe Makes Any Acute Angle

A four-piece universal joint called Band-Ell permits perforated drainage pipe sections to be joined at any angle from 0 to 90 deg, its maker says.

The joints are designed for use with 6-in.-dia Hel-Cor corrugated pipe. Band-Ell sections interlock and fasten to pipe ends with either bolts or wedge fasteners. By varying the location of the flanges in relation to the top of the pipe, the desired angle can be attained. The joint remains tight through earth shifts, frost upheavels and heavy flow, according to the maker.

The joint permits contractors to adapt subdrainage pipe to meet existing topographic conditions and permits the user to reduce his inventory of pipe elbows to this single type. Armco Drainage & Metal Products, Inc., 9360 Curtis Street, Middletown, Ohio.

Heavy-Duty Adhesive Tackles Repairs, New Work

Used to provide a strong bond between like and unlike materials, Weld-All adhesive is ideal for new work, as a repairing agent or as a sealant. It can take the place of nails, screws, rivets and bolts, the maker says.

For new work, it can be used for fastening furing or nailing strips to metal, concrete or masonry surfaces, fastening structural boards, glass blocks, tile and brick. It can be used for mounting electrical fixtures, adhering metal hangers for wires and conduit or for anchoring bolts and screws into concrete, wood or plaster.

Weld-All can be used to repair concrete foundation forms, tools and equipment, seams in furnace pipes and metal ducts or to leakproof cracks in concrete floors and walls. It resists water, alkaline salt solutions, oils, strong bases and nonoxidizing acids, according to the manufacturer.

Industrial sizes of Weld-All adhesive are available in one pint container at $7.20; one quart container at $14.75. Klee Corp., 4011 Red Bank Road, Cincinnati 27, Ohio.

V-POWER B 'PULL* has put *more production, new profits* into big-scraper dirtmoving with: *New speed* . . . up to 28.3 mph. *New capacity* . . . 23 yds struck, 29 yds heaped. *New 2-speed steer action:* slow "no-whip" turns on the haul; quick, sharp turns on the fill. *New strength* . . . final-drive gears now 5¼" wide, 40% larger than before. *Plus* these traditional Tournapull® features: *automatic* power-transfer differential . . . instant-action electric controls . . . low, wide Fullpak®, the industry's *fastest-loading* scraper. And that's not all! Look at the *power* you get . . .

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Remember, too, the V-Power "B" puts power to work through earthmoving's finest transmission. Designed to operate in both high and low range, this unit gives you *10 forward speeds*, instead of the usual 5 speeds. Where other rigs have to down-shift a full gear, the "B" gives you a fast "bonus" speed in each gear-range. Net result: *higher average working speed* all through the cycle, adding up to an extra trip or two every hour . . . for *extra profit* in your pocket! Your LW Distributor has full details. See him soon.

*Trademark BP-2324-DC-1r

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Pereira & Luckman: Different

It has been over two years since William Pereira and Charles Luckman agreed to cut the ampersand that tied them together and end what had become one of the most successful partnerships in modern architecture.

In the past two years each has sought and gained "success" anew. But to Bill Pereira and Charles Luckman, the word "success" has quite different meanings.

There is the "success" that comes with being the biggest; and there is the "success" that comes with being the best. Charles Luckman thinks he can strive for both; Bill Pereira thinks they are mutually exclusive.

By 1958, after only eight years in business, the firm of Pereira & Luckman was already among the biggest. In the opinion of many, it could also claim a place among the best. In 1958 P&L put some $34.7 million worth of projects in place; work in the house assured an even greater volume in years to come.

Then Bill Pereira asked out.

"It is my conviction," he said at the time, "that I should limit the number of projects which my associates and I hope to undertake to those to which we can contribute the most and which we can follow through personally from beginning to end."

Charles Luckman bought out the Pereira interest in the business for an amount variously reported as up to $1 million. (Although the exact figure has never been made public, $500,000 is probably a pretty good guess.)

Why did so successful a team split?

Bill Pereira says the divorce came about because of "a philosophical disagreement." There is ample evidence to support that statement—the two men view architecture in entirely different frames of reference. But there are also hints that clashes occurred on a less lofty plane than philosophy. To this day neither man cares to discuss the other, giving indication that the roots of bitterness run deep.

What had begun as a Damon and Pythias relationship seems to have lasted only up to the point where the two men began working together. Thereafter the association resembled something closer to Gilbert and Sullivan.

Bill Pereira and Charles Luckman had been schoolmates and friends at the University of Illinois. Both were honor students in architecture. Pereira graduated in 1930; Luckman, a year later.

WILLIAM L. PEREIRA—"The measure of an architect is how his work stands in relation to the needs and aspirations of the time in which he was born. The businessman who hires us doesn't need a businessman to do the work."

The Luckman story in the years after college is already a part of modern business folklore—a prodigious career that brought him to the presidency of Lever Brothers at the age of 37 and accustomed him to a salary of $250,000 a year. During his ascendancy in the soap empire, from 1936 to 1943, Charles Luckman maintained a partnership with Kenneth Lind in the Chicago architectural firm of Lind & Luckman, which specialized in residential design. His participation was necessarily confined to part time consultant, chiefly as liaison for affluent clients interested in sumptuous North Shore dwellings that are in the $100,000 to $200,000 price range.

Young Pereira, on the other hand, entered architecture immediately upon graduation, taught architecture for 13 years as professor at the University of Southern California and maintained his own practice even during side excursions into the motion picture business as an art director and producer. By 1950, the year Lever Brothers fired Charles Luckman for reasons still undisclosed, Bill Pereira had achieved a national reputation in architecture and a comfortable, though not opulent, level of financial success.

Nothing seemed more natural in 1950 than for the two old schoolmates to fuse their diverse and considerable talents into the firm of Pereira & Luckman. But the different professional experiences that had created different talents had also created some markedly different attitudes. Hindsight, an accurate if useless tool, suggests that conflict between the two men was inevitable.

Charles Luckman was accustomed to the action and the rewards of big business. His intention, undisguised and, in the beginning, unopposed, was to make Pereira & Luckman one of the biggest businesses in architecture—a feat he accomplished handily.

Definitions of 'Success'

CHARLES LUCKMAN—The successful architect "is capable of discussing long term capital gains, corporation tax structures, real property values, automobile traffic flows—and next year's building costs."

By 1958 the firm was in the early stages of work on the $100-million Prudential Center in Boston; it had the inside track as supervising architects on the $315-million Bunker Hill redevelopment project in Los Angeles; and was coordinating architect on the $46-million Los Angeles International Airport. Pereira & Luckman had planned the Cape Canaveral missile launching complex; the world's largest oceanarium at Marineland; multi-million-dollar, prize-winning factories; office buildings and university campuses. It listed among its clients such blue chip firms as Ford Motor Co., Union Oil, Avco Manufacturing, CBS-TV, Convair, Northrop, IBM, Chrysler Corp., Firestone Tire & Rubber and Lockheed Aircraft.

Bill Pereira says now: "It was easy to get seduced by the idea of bigness. The idea was new to me."

Each man now indicates he can get along very well without the other, each according to the dictates of his own ambition and his own definition of "success" in architecture. Here is how the two men define the word and organize their firms, their own activities and their projects to fit the definitions.

The Professional Businessman

"If you turn over the rock of success," says Charles Luckman, "you will find underneath the architect who is capable of discussing long term capital gains, corporation tax structures, real property values, automobile traffic flows —and next year's building costs."

Mr. Luckman calls his approach to architecture a "total concept"—one that considers all aspects of both aesthetics and practicability. "I cannot understand," he says, "why they are so often treated as mutually exclusive extremes."

The Luckman philosophy is perhaps best summarized in an address he gave last year before the Massachusetts Building Congress:

"The decision to build," he said, "is fundamentally a carefully weighted business decision. The architect, therefore, has the many-sided responsibility of planning a structure that will be economically viable, will be a credit to the owners and to the community, and will be a fusion of beauty and utility. To carry out this total responsibility, the architect must see clearly the connection between a tight money market and the need for accurate calculations of building costs. He must be able to make dependable budgets and stay within them, not only for the sake of his client, but to maintain his own reputation, and to avoid personal bankruptcy."

At Charles Luckman Associates, budgets are regarded as a "moral responsibility." They are monitored by a separate cost control division, which Luckman devised to check and coordinate costs continuously from the inception of each project. Last year 97% of CLA's constructed propects were within budget.

CLA ranks among the five largest architectural firms in the nation, with $202 million worth of projects put in place last year.

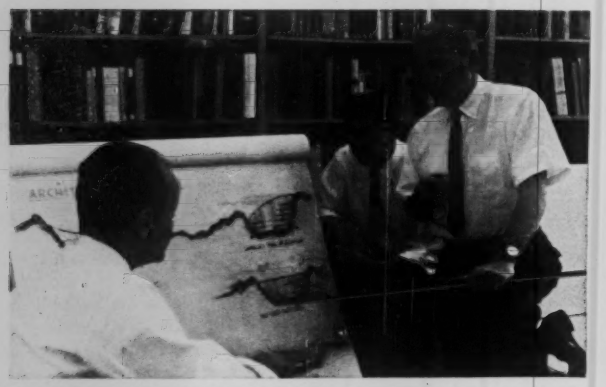
The Luckman flair for organization is evident throughout CLA. Each of the firm's offices is a lacework of some 15 divisions; most of the divisions are in turn highly departmentalized. Divisions include such horizontal functions as planning, architecture, engineering, design, administration and personnel, and also such vertical functions as separate planning units for hospitals, retail stores, office buildings, industrial buildings, schools and universities and aerospace development.

If one had to paste a label in Charles Luckman's box atop CLA's complex organizational chart, "super salesman" would be as good as any. Quick-minded and articulate, Mr. Luckman has been known to deliver a two-hour presentation to a client on the strength of facts gathered in a 15-minute staff briefing. It is in the discovery, discussion and analysis of client needs that Charles Luckman participates most effectively. His professional role is essentially that of a consultant, but a consultant not at all loath to suggest "quite detailed changes in design."

He ferrets out a need for his service with the verve of a used car salesman and a tea leaf reader's creative instinct for the future.

He has, for example, approached two large aircraft companies with the idea that their obsolescent World War II facilities could perhaps be turned to productive use. From each he won

(Turn the page)



THE BIG IDEA—Pereira & Associates is small and informal. All architects, including the boss, become involved in their projects.

THE BIG PITCH—At the top of Luckman and Associates' complex organization, the boss is a super-salesman for the firm's dreams.

$50,000 contracts for further studies—studies that may well lead to major design contracts.

A similar Luckman suggestion led to a study of the parking problem in the Los Angeles civic center, which is in the midst of a $350-million building program. The preliminary study, which CLA did for a nominal $500, whetted the city's appetite and brought a $27,000 contract for a larger study, which is now finished and under review. The Luckman report recommends a series of underground and demountable prestressed concrete parking structures that would cost more than $30-million. Should the plans materialize into design contracts, CLA has reason to hope it will be among those prominently considered.

Among the biggest of CLA's current projects is the site and facility design for the proposed $105-million Linear Electron Accelerator project at Stanford University. This two-mile-long 10- to 15-billion electronic volt tube will take some six years to build. It will be the largest facility in the world for the study of the nucleus of the atom.

Charles Luckman's involvement in the electronics age is considerable. The firm is planning a $25-million 100-acre research complex for Northrop Corp. in Palos Verdes, Calif., the first increment on which will be occupied by the Nortronics Division by spring. A 750,000-sq-ft research facility for Litton Industries is under way. And CLA has been picked to design the 400,000-sq-ft expansion of the CBS network production center in New York, scheduled to begin in April.

Parking is another special Luckman concern. In the design for the proposed new $38-million Madison Square Garden in New York, for instance, he has underslung the three-block sports and entertainment complex with a 3,000-space parking lot. And a 35-story office building scheduled to get under way in Los Angeles this year will be accompanied by a 14-level electronic parking satellite.

Charles Luckman's concern with parking has undoubtedly been fortified by his appointment to the California's Commission on Metropolitan Area Problems. Long active in government affairs, he has also been named to the Board of Trustees of the California State Colleges. These activities have prompted speculation that he aspires to political office. But so far he has made no public declaration to this effect.

All in all, Charles Irving Luckman is a practical man. Whatever his personal master plan may be, it is certain to reflect his architectural philosophy—"I do not believe in the revolutionary master plan," he says. "I believe only in the common sense master plan."

The Busy Professional

"My goal," says Bill Pereira, "is to be a good architect. Specifically, that means I have the traditional responsibility to master the arts involved in the practices of the profession and to become sufficiently educated and persistent as a student in all the human affairs that have an influence on the building and land planning sciences.

"All the humanities, all the cultural arts, and the sciences that led to the automobile, television, the airplane, the new space sciences—all have a profund effect on the architecture of our time. The measure of an architect is how much of this he saw and how his work stands up in relation to the needs and aspirations of the time in which he was born."

Loftiness of thought does not preclude a desire that Pereira & Associates turn a profit.

"We like to get paid for what we do," says Mr. Pereira, "it's very flattering. But if making money were our only goal, there are more intelligent ways of doing it. It's an anachronism, but the better job you do, the less money you make. All architects charge the standard fees, but one might be satisfied with a solution after five weeks of effort and the construction of one [illegible], another might put in five months and build 20 models."

Bill Pereira sums up his approach to architecture this way:

"It comes down to a question of treating this occupation as a profession or as a business. One side has to dominate. You can't have both the best business organization and the best professional organization.

"Our view is the businessman who hires us doesn't need a businessman to do the work. He needs an architect."

Pereira & Associates is an informal, free-wheeling operation. It has no professional male executives, no sales specialists, no draftsmen as such. Women, with clerical backgrounds, write all the proposals and contracts and administer the financial side of the business. Each architect does his own drafting. There being no departments, all talents do all things.

"A man might be a general on his own project one day," Architect Pereira explains, "and the next day he'll work as a private on another project. Each man is a complete architect."

One of the projects under Boss Pereira's personal direction is the Children's Theater Center, modestly budgeted by the Los Angeles Recreation & Parks Commission at $150,000.

He has already spent more than eight times his fee in designing this theater. The limited construction budget is taxing his ingenuity, but by no means dampening it. To conserve construction money, he has conducted a quest for

(*Story continues p. 82*)

The largest ever built, these 165-ft-high, 400-ft-long antennas are arranged in mile-long, semi-circular groupings near Thule, Greenland, and Clear, Alaska. They will provide a multi-thousand-mile warning of a ballistic missile attack.

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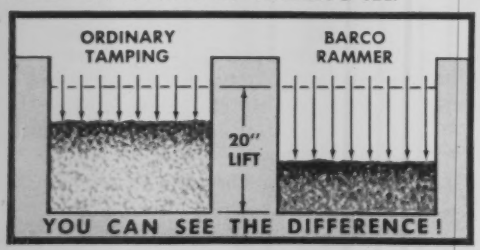

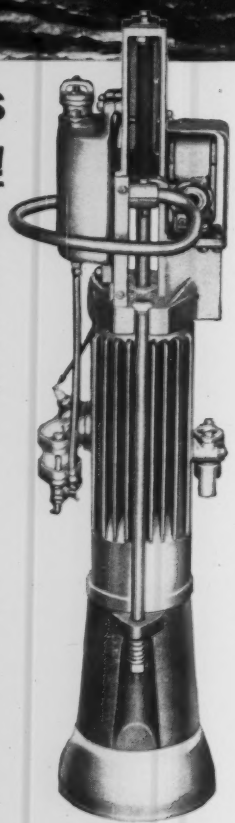

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material through Los Angeles city lots and has turned up rich depositories of old telephone poles, used brick and ancient railroad ties, all of which will go into the finished construction.

Pereira & Associates employs a total of 50 persons, "and that is as big as we want to get," Bill Pereira insists.

Pereira & Associates, like Charles Luckman & Associates and like Pereira & Luckman before that, is heavily involved in master planning. But Bill Pereira likes to distinguish his approach as one of "creative" rather than "logistic" planning.

He defines "logistic" planning as a process of merely gathering the facts and putting them together. "Our approach is the reverse of this," he says. "We try to find out the one or more possible destinies of a piece of land and then try to determine what it would take to achieve those destinies."

This approach has imparted a distinct excitement to a number of master plans currently on the Pereira drawing boards.

For a 12,500-acre tract in California's Santa Monica Mountains, Mr. Pereira visualizes a complex of about 10 cities, each with a population of about 6,000, each with its own distinctive character. One of the villages would be an industrial center, another business, another cultural, another educational, another residential. To disturb the natural topography as little as possible, he is considering such solutions as hanging apartment buildings from a bridge between embankments. Other structures would be molded into the contour of the land by gunniting the slopes and throwing a bridge across.

Another "total community," Bishop Ranch, near UCLA's Santa Barbara campus, is in the advanced planning stage in Pereira's shop. With a projected population of 45,000 by 1970, this land parcel will be integrated into the university community by what Mr. Pereira terms "selective inclusion." Residences would be a series of town houses built around a golf course. It will include a research and development park, a complete town center surrounding a central plaza, a hotel, shops and office buildings.

He has taken another bold tack in a master plan for an existing university campus. To tie the campus' present architectural potpourri into a unified complex, he is considering enclosing all existing buildings in glass cages, which would give each structure an added shell of classroom and office space at a cost of about $15 a square foot. The glass extension would be connected to form quads.

(*Story continues p. 85*)

You and UNIT earning power

. . . a payload partnership

Completely satisfied with the performance record of his two UNIT ¾ YD. excavators, Mr. James Lavin of JFL Trucking and Excavating, West Allis, Wis., says he'll pick UNIT again when buying a new machine.

Buying major construction equipment is almost like marriage — you'll live with your choice a long time. That's why it's important to choose the bigger *earning power* of a UNIT excavator or crane. You'll find that your equipment investment will pay off with fast cycle speeds, big output and more dependable performance than other machines in the same size range. You and your UNIT will have a true *payload partnership.*

Fast work on the job — lowest operating cost — negligible downtime . . . these are but some of the reasons why the *earning power* of a UNIT lets you knock out the competition at bid letting time. You win more contracts with a combination of job-proved features, finest quality components and unmatched workmanship.

Features like UNIT'S exclusive one-piece cast main machinery gear case that completely encloses all gears and shafts in a constant bath of lubricant . . . eliminating frequent adjusting or greasing. UNIT offers straight-in-line mounting of the engine with the main machinery to give longer machine life and perfect alignment of all working parts. All disc-type operating clutches are interchangeable . . . can't grab or self-energize. The exclusive automatic traction brakes on crawler machines assure positive, safe braking power . . . even on the steepest grades. Long, wide-spread crawlers and a big, heavy carbody provide the solid working base you need to get full dippers in the toughest material.

You can start on the road to your *payload partnership* right now by calling your UNIT dealer. He's got the detailed information you need on the 5 UNIT convertible crawler machines, 4 UNIT convertible truck cranes and 2 UNIT mobile cranes.

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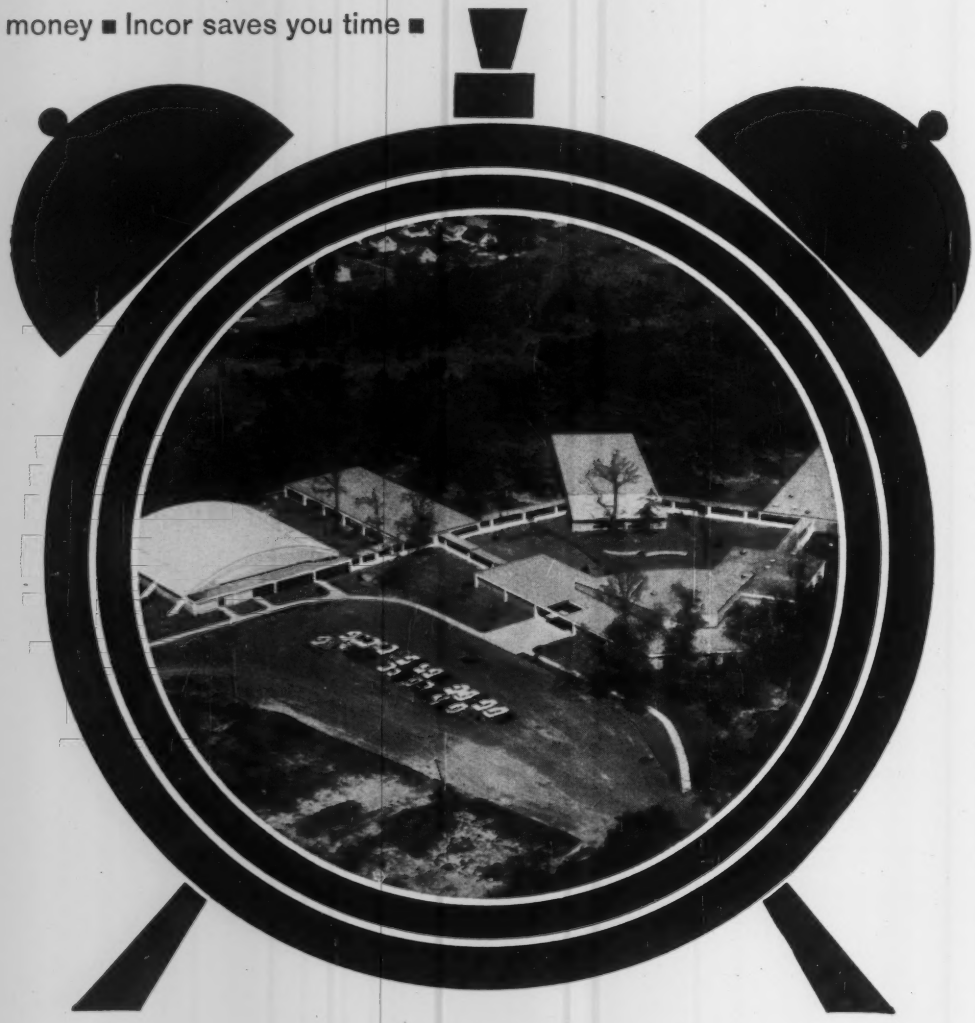


precast concrete and Incor cut school cost $216,000 below New Jersey average

Exceptional construction economy along with fire-safety, quality, and beauty . . . that's the sharp lesson taught by Iselin (N. J.) Junior High School. Built for Woodbridge (N. J.) Board of Education, this $1,462,000 school opened right on schedule.

Economy was achieved by extensive and imaginative use of precast and prestressed concrete units made with Incor. Incor 24-hour cement gives any job a head start in construction time and cost savings. Here, the cost per pupil of $1,462 compared with the New Jersey average of $1,678, thus saving taxpayers $216,000 on this 1,000-pupil school.

With Incor, jobs get done faster . . . men, forms, and equipment are released quicker. And its durability is proved by 33 years of performance. Estimate with Incor on your next project . . . you'll find it pays.

Iselin N. J. Junior High School—Architect-Engineer: Finne-Lyman-Finne, Elizabeth, N. J. Educational Consultant: Engelhardt, Engelhardt, Leggett & Cornell, New York, N. Y. General Contractor: Michael Riesz Co., Fords, N. J. Prestressed Concrete: Atlantic Prestressed Concrete Co., Subsidiary of The Warner Co., Trenton, N. J.

AMERICA'S FIRST HIGH EARLY STRENGTH CEMENT

INCOR®

LONE STAR CEMENT CORPORATION, NEW YORK 17, N.Y.

He was also contracted to design a $5-million Los Angeles County Museum and to plan a gigantic research center for General Telephone Co. in Palo Alto, Calif. But there is little question that Pereira's biggest influence will be felt directly in the area of higher education. He has, for example, undertaken the design of major laboratories at the California Institute of Technology, and fine arts centers at the University of Southern California, the University of California at Los Angeles, and Brigham Young University, Utah.

He is about to embark on planning a new University of California in Orange County.

This project will go up on a 1,000-acre tract on the Irvine Ranch. Pereira Associates had also contracted to do a master plan for a city that would involve the entire 93,000-acre ranch. It is estimated that the property will ultimately entail a capital investment of more than $2 billion.

Looking back on his career, Bill Pereira says: "I've been in practice 30 years. I know what I've failed to do and what I didn't fail to do. I still have time not to fail so much."

Raymond Award Goes To E. J. Klohn of Canada

A check for $1,000 was presented to Earle J. Klohn of Vancouver, B. C., at a luncheon in San Francisco, last month, for submitting the best paper in the 1960 competition for the annual Alfred A. Raymond Award. It is sponsored by the Raymond Concrete Pile Division of Raymond International Inc. of New York.

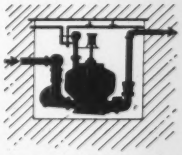
Mr. Klohn is principal engineer for the Vancouver consulting firm of Ripley & Associates. The title of his winning paper was "Pile Heave and Redriving".

At the same luncheon a special award of $500 was made to Charles E. Hall, International Engineering Co., Inc., San Francisco, for his paper "Compacting a Dam Foundation by Blasting".

The panel of judges, which reviewed about thirty papers entered in the competition on various subjects related to foundations, was composed of Ralph B. Peck, University of Illinois; William W. Moore of Dames and Moore, consulting engineers, San Francisco; and Frank A. Marston of Metcalf & Eddy, consulting engineers, Boston. Professor Peck, who has served on the panel during the three years since the award was established, has been replaced by Prof. Jorj O. Osterberg, Northwestern University, who will serve for the next three years.

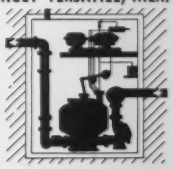
Which sewage lift station is best for your job?

TOPS IN DEPENDABILITY AND SAFETY



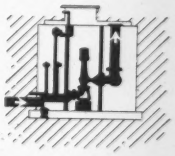
Concrete or steel underground station with Shone® Type S pneumatic ejector, mechanically controlled (warranted 25 years). Remote air supply. Nothing electrical; maintenance free, operates even under water. For municipalities and large subdivisions.

SURPRISINGLY VERSATILE, INEXPENSIVE



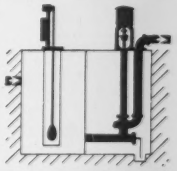
Shone® Type SAC station, underground in concrete vault. Mechanically controlled ejector (warranted 25 years) has its own compressor. Frequently less costly than package stations. Finds use everywhere.

PACKAGE STATION



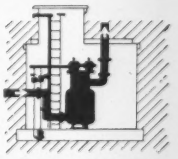
Quality underground station with vertical, short-coupled (Series 6260), dry pit centrifugal pumps. Quality design and equipment give good service life at nominal cost. For small permanent stations, growing areas.

LOW FIRST COST—EASY INSTALLATION



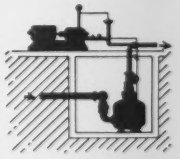
Two-compartment steel basin with centrifugal vertical wet pit pump. Pumps are not submerged; motors protected from flooding. Low first cost; fast installation. For buildings, small growing subdivisions.

ULTIMATE IN PACKAGE DESIGN



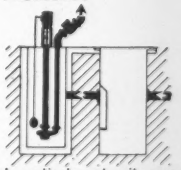
Package underground station with Expelsor® pneumatic ejector, electrode controlled. Sanitary and dependable, low maintenance, easy to service. Recommended for municipal and subdivision applications.

BUILDING TYPE STATION



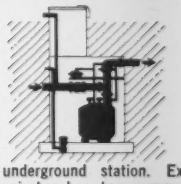
Expelsor® pneumatic ejector station designed for use in buildings. Compressor is on basement floor; ejector on floor below. Sealed installation gives safe, odorless handling of sewage indoors.

SPECIAL PROBLEMS?



Centrifugal vertical wet pit pumps with adjoining settling basin. Good for areas where sand or old sewers create problems. Special pump construction for abrasive or corrosive conditions, industrial wastes.

MAXIMUM RELIABILITY—MINIMUM SPACE



Package underground station. Expelsor® pneumatic ejector has two compartments, duplex compressors and controls. Excellent service accessibility. Especially suited for subdivision and municipal lift stations.

L-5911

The answer depends on the job. Is it to be a temporary station? What about future loads? How much maintenance will it get? What type of power is available? These and many other questions must be weighed carefully and without bias. In making the decision, why not put Yeomans 61 years' experience (59 on underground stations alone) to work? Because Yeomans builds **the only complete line** of sewage lift stations in the industry, recommendations are **impartial** and in your best interest. Phone, wire, or write now.

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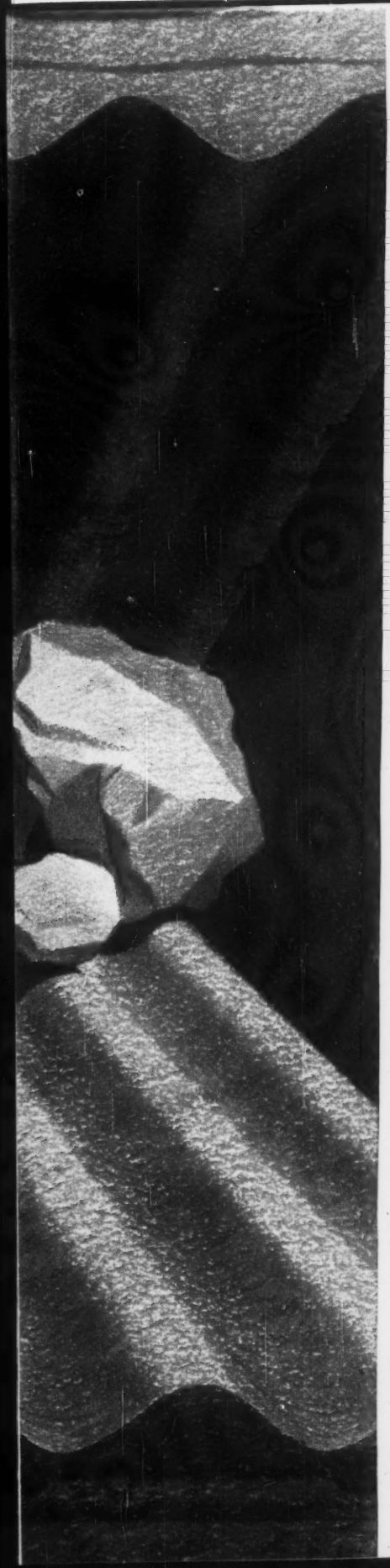

SHOULD YOU BUY REPLACEMENT PARTS FROM THE COMPANY THAT BUILT YOUR CRUSHER?

Star Rock Products did, and increased their tonnage 75%

At Star Rock Products Co., Anaheim, California, crusher jaw plates previously used were giving only about 6 months' service. Large rocks often caused the jaw plates to "give" enough so the rocks wouldn't crush. Jams and costly delays resulted. Plates would often flow and crack.

Amsco and the crusher manufacturer developed a new design, using 2% chrome (Amsco MY) alloy. After 6 months' service, the plates were in excellent condition. Jams and delays have been eliminated and tonnage handled increased 75%.

Cases like this are not unusual, because it's often difficult to resist an "experiment". After one experiment, though, most producers rediscover that the "factory part" delivers the goods.

Amsco and leading crusher manufacturers work together to assure you of maximum value in parts such as hammers, rolls, jaw plates, mantles and concaves. Avoid experiments — buy maximum value through your crusher manufacturer or his dealer.

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Age has its advantages when you are dealing with fire hydrants, because hydrants must provide many years of reliable service. When a manufacturer has been in business 100 years or more, the quality of his product is well known.

R. D. Wood Hydrants have stood the test of time. There are more than a million of them in use right now. This says a great deal for the excellence of the product and the reliability of service.

When you deal with R. D. Wood (over 100 years in the hydrant business) you have the comfortable feeling that we will still be around when your equipment needs service or even replacement.

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Established in 1803

Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds)

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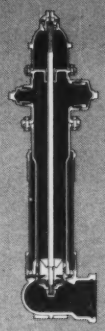
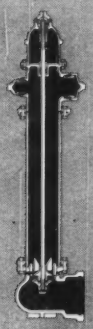
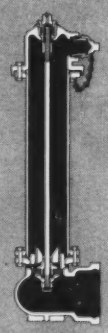


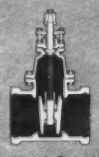
R. D. Wood Mathews Modernized Hydrant with replaceable barrel.



R. D. Wood Mathews Flange Barrel Hydrant . . . dry head construction keeps it operating in every kind of weather.



R. D. Wood Swivel Joint Hydrant can be faced in any direction.



R. D. Wood Gate Valve—bury it and forget it.

Books

Photo Use in Many Fields

MANUAL OF PHOTOGRAPHIC INTERPRETATION — Editor in Chief, Robert N. Colwell. 868 pages. American Society of Photogrammetry, Washington 5, D. C. $12 for members, $15 for nonmembers.

To give this book the kind of authority properly to be expected from a professional-society publication, the American Society of Photogrammetry called on nearly a hundred experts to contribute according to their particular specialties. Then the Society membership was invited to review the results and submit further contributions. The final product is a comprehensive work on photo interpretation.

Individual chapters are devoted to applications of the science in particular fields—engineering, geology, soils, hydrology, urban-area analysis, wildlife management, agriculture, archaeology, geography. One chapter is devoted to highly specialized applications, such as photomicrography, in science and industry. Other chapters treat the history and fundamentals of photo interpretation and the status of education in the field.

More than 600 photographs illustrate the volume. Many of them are mounted in stereoscopic pairs to permit three-dimensional viewing. Sixteen pages of photos are in full color to illustrate the advantages and limitations of various types of color and special purpose films as compared with black and white films.

The book contains a glossary, which may help establish something approaching official status for many terms now lacking it and, at the same time, clear up possible confusion over definitions for some terms in general use.

This manual is a companion volume to the MANUAL OF PHOTOGRAPHY, previously published by ASP.

Chemical Plant Costs

COST ENGINEERING IN THE PROCESS INDUSTRIES—Edited by Cecil Chilton. 475 pages. McGraw-Hill Book Co., New York, Toronto, London. $11.

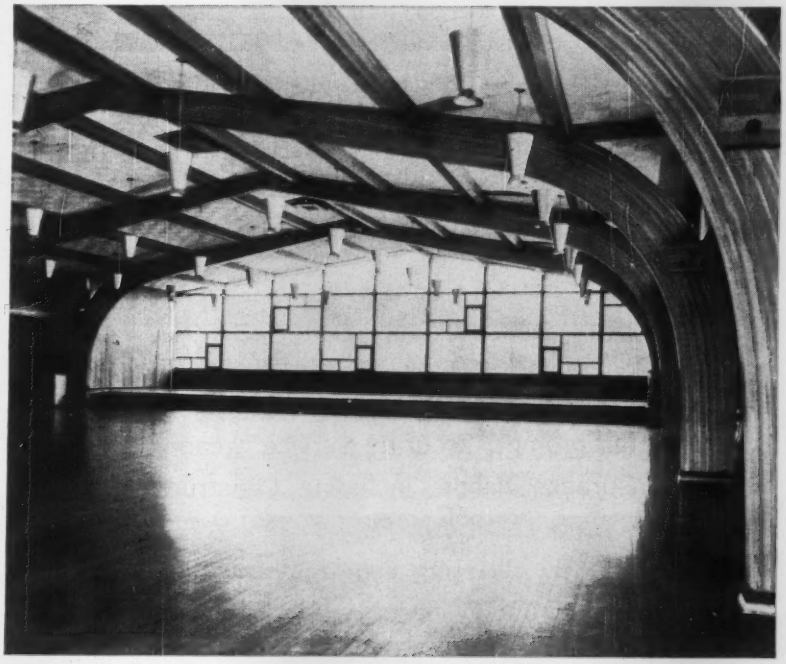
More than 100 articles that have appeared during the past decade in CHEMICAL ENGINEERING, a McGraw-Hill publication, on estimating the cost of constructing and operating chemical plants have been combined to form an invaluable reference work. A substantial portion of the seven-chapter book deals with construction costs.

The opening chapter deals with

(*Books continued p. 90*)

Ballroom-lounge of Montana State Lodge, student union building of Montana State University, Missoula, Montana.

Space provided: dining room; kitchen; ballroom-lounge; offices; student organization offices and meeting rooms; rest rooms; outdoor dining patio; faculty rooms; student store. *Structural framing:* reinforced concrete for first floor; glulam timber beams and arches for second floor, spaced at 20′, with glulam purlins spaced at 6′-8″. *Exterior walls:* stone over concrete block for ground floor; wire brushed Tim-Deck applied vertically for upper floor. *Interior walls:* wood paneling in dining room, lounges and offices; structural glazed block in kitchen; painted pumice block in rest rooms. *Heating:* steam heat with direct radiation and unit heaters supplied by central heating plant. *Ventilation:* unit ventilators with unit exhausters for larger areas. *Lighting:* generally incandescent, with fluorescent fixtures in offices. *Floors:* oak for ballroom-lounge; quarry tile for kitchen, rest rooms and concourses; asphalt and rubber tile in offices and conference rooms. *Roof:* built-up roof over rigid insulation and heavy timber decking. *Area:* 78,000 square feet. *Cost:* $12 a square foot (in 1956).



Architects: Brinkman and Lenon, Kalispell, Montana.
Contractors: Hightower & Lubrecht, Missoula.

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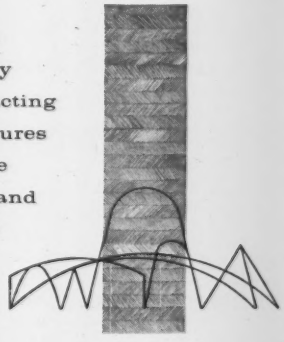
Behind the handsome appearance of the glulam arches and purlins by Timber Structures, Inc. is an exacting program of quality control. This assures architect and owner alike that the unseen values of permanence and satisfactory performance on the job are equal to the beauty that is apparent at a glance.



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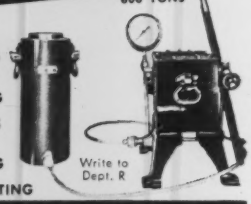

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principles of estimating. Articles comprising it range from presentation of methods of making preliminary, rough estimates to analysis of techniques for compiling accurate estimates. One article defines terms commonly used in cost estimating.

The second chapter deals with process equipment costs. The third covers non-equipment capital costs—pipe, insulation, various labor factors, power.

Construction costs are highlighted in the fourth chapter. It contains such articles as what Price Process Plants?, Six-Tenths Factor Applies to Complete Plant Costs, Where Do Construction Dollars Go? and How Plant Costs Vary with Size. The remaining chapters deal with operation costs, profitability analysis, depreciation and economic evaluations.

Steel Design Textbook

DESIGN OF STEEL STRUCTURES—By Boris Bresler and T. Y. Lin. 710 pp. John Wiley & Sons, Inc., New York, London. $9.75.

Though intended primarily for use as a textbook for both elementary and advanced civil engineering courses, this book is thorough enough to be valuable as a reference for men in practice.

Throughout the text, fundamental principles of mechanics are applied to steel design. Thus, the reader is expected to have a knowledge of statistics, dynamics, mechanics, materials and some structural theory.

A major portion of the book is devoted to design of structural components—compression and tension members, beams, trusses, columns, connections. Only an introductory treatment of buildings and bridges is given.

Both the elastic and plastic design theories for structural steel are presented in easily understood form. A useful chapter on design of light-gage steel also is included.

Drainage in the U.S.S.R.

PRINCIPLES OF UNDERDRAINAGE DESIGN IN THE BELORUSSIAN SSR—A translated publication of the Academy of Sciences of the Belorussian SSR. 95 pages. Office of Technical Services, Department of Commerce, Washington 25, D.C. $1.00.

Report discusses various types of Russian drainage systems, describing the criteria for the selection of systems, equipment to be used, and computations to establish drainage design, spacing and other factors. One chapter is devoted to a description and illustrations of Russian equipment.

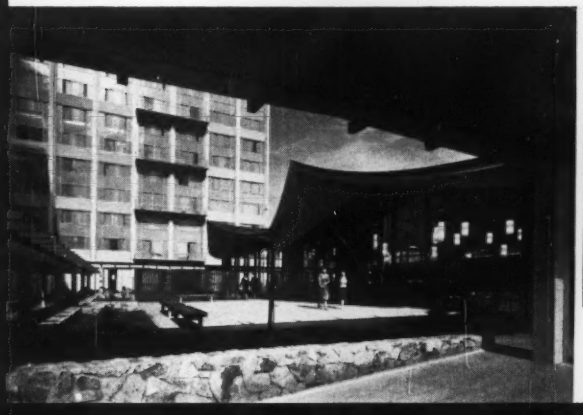
(*Books continued p. 92*)

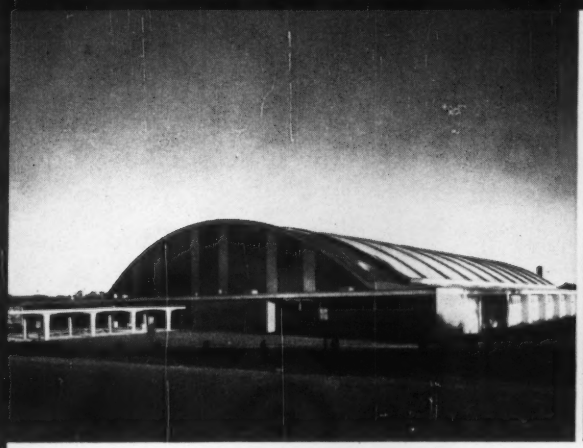
Greater Design Flexibility makes

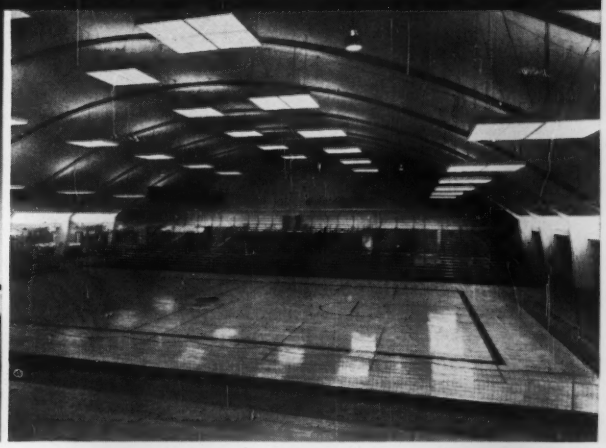
REINFORCED CONCRETE

both Contemporary and Functional

Residence Halls, and Dining Halls, University of California
Architect: Warneke & Warneke, San Francisco & Oakland
Structural Engineer: Isadore Thompson, San Francisco
General Contractor: Dinwiddie Construction Co., San Francisco







Field House, Northern Illinois State College, DeKalb, Illinois
Architects & Engineers: Perkins & Will, Chicago, Illinois
General Contractor: J. L. Simmons Co., Inc., Chicago, Illinois

The great difference in these building designs emphasizes the unlimited flexibility possible with reinforced concrete. Curve it . . . arch it . . . make it square . . . make it round—only reinforced concrete can give you such complete freedom for achieving structural beauty while meeting all functional requirements. Before you build, it will pay you to investigate the many design and economic advantages of this versatile construction material.

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*Based on DuPont "MYLAR" polyester film.

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TOKYO, JAPAN
CONTRACTOR — ENGINEER

On being questioned as to where his firm intended to put the new, two million dollar Biology Laboratory for Itchi U., Hall replied in confidence:

"Nowhere else but on Arkwright. We're just waiting for the committee to work some of the bugs out of their preliminary plans, and then we'll lay it out. Could be either tracing cloth or drafting film. You know Arkwright gives you a quality surface on both. We like those sharp, clear lines . . . that permanent translucency . . . that resistance to wear and tear. You ought to try it . . . Arkwright."

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FINISHING DIVISION
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STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER—Eleventh edition. 626 pages. American Public Health Association, Inc., 1790 Broadway, New York 19, N. Y. $10.00; Members American Water Works Assoc., Water Pollution Control Federation, American Public Health Assoc. $8.00.

STRUCTURAL ANALYSIS—by Jack C. McCormac. 375 pages. International Textbook Co., Scranton 15, Pa. $10.50.

1301 REVIEW PROBLEMS FROM EIT AND ENGINEERING REGISTRATION EXAMINATIONS—388 pages. International Textbook Co., Scranton 15, Pa. $7.50.

AN ILLUSTRATED DICTIONARY OF PLUMBING TERMS—by Evan Berry. 244 pages. Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y. $6.00.

THE SQUEEZE: CITIES WITHOUT SPACE—by Edward Higbee. 348 pages. William Morrow & Co., Inc., 425 Park Ave. South, New York 16, N. Y. $5.95.

ENERGY IN THE AMERICAN ECONOMY 1850-1975: ITS HISTORY AND PROSPECTS—774 pages. The Johns Hopkins Press, Homewood, Baltimore 18, Md. $12.50.

CONSTRUCTION ESTIMATES AND COSTS—by H. E. Pulver. Third edition. 617 pages. McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 36, N. Y. $12.00.

ELEMENTARY ENGINEERING MECHANICS—by Eugene George Key. 457 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $5.50.

THE ENGINEERING INDEX — 1959 — 75th edition. 1,532 pages. Engineering Index, Inc., 29 West 39th St., New York 18, N. Y. $70.00.

COMPILATION OF STANDARDS PLASTICS D-20—1,242 pages. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $9.00.

SYMPOSIUM ON IDENTIFICATION OF WATER-FORMED DEPOSITS—STP 256—80 pages. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $2.75.

UNITED NATIONS STATISTICAL YEARBOOK—1959—618 pages. Columbia University Press, 2960 Broadway, New York 27, N. Y. Cloth cover $10.00; paper cover $8.00.

THE ASPHALT HANDBOOK — Revised Edition. The Asphalt Institute, Campus, University of Maryland, College Park, Md. Free.

REVOLUTION IN TRANSPORTATION—by Karl M. Ruppenthal. 153 pages. Graduate School of Business, Stanford University, Stanford, Calif. $4.75.

PROFESSIONAL ENGINEER'S EXAMINATION QUESTIONS AND ANSWERS—by William S. La Londe, Jr. Second Edition. 589 pages. McGraw-Hill Publishing Co., Inc., 330 West 42nd St., New York 36, N. Y. $7.50.

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Make a mechanic's job simpler and he'll do it faster, too.

And that's just what "Time Study" TORQMATIC 3-speed transmissions do.

First place, they have only 3 speeds where other hydraulic transmissions have 4—naturally, the loader operator makes his machine crowd, dig, load and travel faster.

And they're far simpler for mechanics to maintain, too. Gears, for instance, can be replaced in about 4 steps where other hydraulic transmissions need 20 or more. A leading tool manufacturer lists only 2 special tools for TORQMATIC —15 for another hydraulic transmission.

And overhauls on "Time Study" TORQMATIC DRIVES come around far less often, too. *In fact, "Time Study" TORQMATIC is designed to need no major service for two engine overhauls.*

Faster time on the job, less time in the shop—two big reasons why 9 out of 10 loader manufacturers use TORQMATIC DRIVES. Details? Write Allison today.

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CONCRETE PERFORMANCE REPORT:

Monolithically-cast POZZOLITH concrete lift slabs speed construction of new "twin" apartment buildings

LIFT SLAB

Huron Towers, new twin apartment buildings in Ann Arbor, Michigan, represents the largest scale use of the Youtz-Slick lift-slab method to date.

Two-at-a-time—Concrete floor slabs were placed the full width and length of the building at ground level, then raised into place—two-at-a-time—by hydraulic jacks mounted atop the building columns. The slabs measure 215 ft. x 69 ft. x 9 in. and weigh 830 tons each. Thirty-six jacks were required to lift the gigantic 1,660-ton loads.

No "pour strips"—Ordinarily, with lift slab, each slab is cast in sections which are lifted separately. Pour strips are then formed and placed conventionally. On the Huron Towers project, each floor was cast *monolithically . . . without joints or pour strips* of any kind.

Strength, plus economy — Specifications originally called for a minimum of 6.5 bags of cement for 4000 psi concrete. Preliminary tests, however, showed that the *specified strength could be obtained most economically* by using 5 bags of cement and POZZOLITH . . . and provided the desired reduction in shrinkage that allowed construction of these large slabs without pour strips. This mix design was submitted, approved and used throughout the Huron Towers project. All tests on POZZOLITH ready-mix concrete exceeded the specified strength.

Master Builders MBVR air-entraining agent was also employed in all slab concrete to obtain the air content specified for the outer portion of each slab, which will ultimately be a cantilevered balcony exposed to weathering.

Aside from the record number of liftable slabs and the near-record lifting height, the Huron Towers project includes two other interesting features: The concrete casting operation and the method of winter protection.

Contractor ingenuity—Since most of the floors in the two buildings are identical, the contractor developed a unique sequence of casting the slabs at the lower-basement floor level. One complete floor, covering nearly 15,000 sq. ft. and containing 410 cu. yd. of concrete, was cast in a three-day cycle. As soon as one crew had completed placement of the 33 tons of reinforcement and conduit for the floor slab in one building, it moved to the other building to begin preparing a new slab. At the same time, another crew placed concrete for the slab in the first building, pumping it into place through an 8-inch line, at a rate of 40 to 60 cu. yd. per hour, from a centrally-located pump.

Weather, or not—This sequence of slab-casting operations was maintained throughout the winter months by protecting the working areas from freezing by enclosing them with 75,000 sq. ft. of lightweight plastic material and maintaining a temperature of approximately 55 F. One-percent calcium chloride was added to the mix to accelerate early strength gain.

POZZOLITH concrete was used throughout both buildings for (1) *ease of pumping* . . . there were no plugged lines during the entire pumping operation (2) *virtually no honeycomb* . . . despite intricate reinforcing steel and electrical and mechanical work in the slabs (3) *minimized shrinkage and cracking* . . . inspection after lifting showed no cracks through the slab.

Approximately 12,000 of the 25,000 cu. yd. of POZZOLITH ready-mix con-

LOWER BASEMENT FLOORS in both buildings were cast on the ground to serve as casting beds for the liftable slabs. The ground floor and upper basement floor slabs are 14" plus 2½" joist-type slabs spanning onto wide flat beams of the same depth. The 12 apartment floors and the roofs are flat slabs, all 9" thick except the first living floor, which is 10".

HURON TOWERS, Ann Arbor, Michigan, was designed by King and Lewis Architects, Inc. with structural engineering by R. H. McClurg Associates, Inc.—both of Detroit. Project Manager was B. R. Sloan and Project Engineer, Willard C. Reeder—both of Long Construction Company, General Contractor, Kansas City, Mo. F.H.A. Resident Engineer was Hugh Foley. Lift slab Consulting Engineer was Robert D. Campbell, Kansas City, Mo. Killins Gravel Co. of Ann Arbor supplied the POZZOLITH ready-mix concrete.

TOWERS

MAXIMUM LIFTING HEIGHT of roof slab for this building was 145 ft. For its "twin"—142 ft. The number of liftable slabs—15, in this building, sets a record as the greatest number of concrete decks to be lifted in the United States. Total floor area of the two apartment buildings is 465,000 sq. ft.—431,000 of which were lifted.

crete were used in the lift slabs—the balance went into the foundation and attached parking garage.

Field service—Master Builders field man worked closely with the engineer, contractor and ready-mixed concrete producer on the Huron Towers job to aid in achieving the common goal of uniform, high-quality concrete at lowest cost-in-place.

No matter how large, how small, how unique or how conventional the project, call in the local Master Builders field man. He will show you how concrete produced with POZZOLITH is a more durable and versatile building material . . . superior in performance, quality and economy to plain concrete or concrete produced with any other product.

The Master Builders Company
Division of American-Marietta Co.
Cleveland 18, Ohio
World-wide manufacturing and service facilities

Our 50th Year

MASTER BUILDERS® POZZOLITH*

*POZZOLITH *is a registered trademark of The Master Builders Co. for its ingredient for concrete which provides maximum water reduction, controls rate of hardening and increases durability.*

Whatever the weather... your pay days start sooner ...with STEEL

STEEL pays off sooner in any weather.

Construction of the steel-framed Harvest House Motor Hotel in Boulder, Colorado, continued on schedule through winter weather. It was completed *three months earlier* than would have been possible with other materials.

Here's what the owner says the time saving meant to him:

Additional Revenue for the Owner

First month — August	**$25,457**
Second month — September	**16,955**
Third month — October	**13,439**
Total for three months	**$55,851**

Plus: Coffee Shop, Dining Room and Cocktail Bar income for three additional months.

It pays to build in steel – not only for earlier income, but for construction on schedule the year around. And steel lends itself so well to modern design that more motorists stop, stay and pay.

American Institute of Steel Construction

101 Park Avenue, New York 17, N. Y.

Tight bidding marks $1.8-million award for . . .

Washington's Elevated Highway

Close bidding marked the $1,881,012 contract race for the 12-span inner loop of Washington, D. C.'s Southwest Freeway. The joint venture of Ruckman-Hansen, Inc., & Roy Ryan, Inc., Harrisburg, Pa., inched ahead of the second low by $4,891, a narrow 0.3%, while the high of five missed by only 13%. Work is for the Government of the District of Columbia, Department of Highways and Traffic. Gannet, Fleming, Corddry & Carpenter, Inc., Harrisburg, Pa., are the engineers for the project.

Construction of the multi-span structure with connecting ramps is scheduled to be completed in 500 calendar days. Its 12 spans vary in length from 45 ft to 85 ft. The design is reinforced concrete abutments and piers, built-up steel girders and a reinforced concrete deck.

The contractor is also responsible for about 1,350 lin ft of grading and drainage, which include a pumping station for storm water. The owner will supply the 2-in.-dia or less valves for the watermain.

Prices on 451 lin ft of 6 in. cast iron pipe and fittings ranged from a low of $4.50 to $12.75 a lin ft. For 35 lin ft of 8 in. pipe, unit prices jumped from $6.50 to $22.00. Cast iron pipe is defined by ASTM standard A 74-42.

Class B-B concrete for the substructure drew unit bids ranging from $50.50 to $63.00 for 3,440 cu yd, and prices for 1,153 cu yd of superstructure concrete jumped from a low of $55.00 a cu yd to a high of $90.00. For 1,540 cu yd of pumping station concrete, bids showed a spread of $35.00 between the low of $63.00 and high of $98.00. Similarly, a wide spread marked the unit bidding for subfoundation concrete. The low of $22.00 a cu yd was $33.00 under the high.

The contractor will use class B-B concrete with a compressive strength of 3,000 psi. This requires six bags of cement, 1,290 lb of fine aggregate, 1,780 lb of course aggregate, and 6.5 gal of water per bag.

Minimum wage rates determined by the Secretary of Labor pursuant to Section 115 of the Federal-Aid Highway act include: carpenters, $3.75/hr; cement masons, $3.775; laborers, $2.175; power shovel operators, $3.755; reinforcing ironworkers, $3.95; and miscellaneous unskilled labor on paving and incidental grading, $1.90.

The bidding included:

1C	Ruckman-Hansen, Inc., Roy Ryan Sons Co., Inc., Harrisburg, Pa.	$1,881,012
2	James McHugh Const. Co., Chicago, Ill	1,885,903
5	Princemont Const. Corp., Rockville, Md	2,164,635

Bids: 9-15-60 Items	Unit	Quantity	Unit Prices 1C	2
Clear & grub	ls	job	$20,000	$8,000
Exc, unclassified	cy	252,750	0.95	1.39
str	cy	6,807	10.00	7.00
Bf,& fill	cy	17,949	2.50	2.00
porous	cy	547	12.50	10.00
PCC base 8"	sy	150	8.50	7.00
Asph conc binder	t	254	10.00	15.00
surface sheet	t	254	11.00	20.00
Stone, old curb, remove	lf	4,590	1.00	0.50
Sodding	sy	2,024	1.00	0.90
PCC, curb & 12" gutter	lf	160	4.50	3.50
curb 8"x24"	lf	380	3.00	3.00
sidewalk	sy	100	7.00	6.00
Exc, trench x depth				
10'-20'	cy	1,635	8.00	6.00
20'-30'	cy	152	12.00	30.00
RCP, culv, storm sew 15"	lf	2,430	13.75	9.00
18"	lf	398	17.50	18.00
24"	lf	644	19.50	25.00
27"	lf	354	21.00	28.00
30"	lf	498	24.00	35.00
Pipe, clay, san sew, x str				
12"	lf	732	16.50	17.00
18"	lf	48	21.50	30.00
Connection, drop 27"	ea	1	none	500.00
WIP & fittings 3"	lf	92	6.00	15.00
4"	lf	199	6.25	18.00
6"	lf	270	10.00	16.00
CIP & fittings 6"	lf	451	4.50	7.00
8"	lf	35	6.50	8.00
Drain, cleanouts	ea	6	92.00	100.00
VCP underdrain 8"	lf	775	4.00	6.00
CIP mech joint 20"	lf	100	20.50	50.00
Underdrain, rdwy 6"	lf	4,978	2.50	5.00
MH standard	ea	4	585.00	400.00
10'-16' deep	ea	4	875.00	600.00
special	ea	1	785.00	1,000
Catch basin, standard	ea	1	350.00	800.00
Inlets, drop	ea	1	330.00	300.00
w reinf	ea	3	540.00	350.00
curb tp A-1	ea	14	350.00	400.00
C-1	ea	1	125.00	300.00
C-2	ea	1	160.00	350.00
A-1				
w reinf	ea	4	650.00	420.00
B-1				
w reinf	ea	2	650.00	450.00
B-1	ea	27	350.00	300.00
special				
A-1	ea	1	1,025	600.00
B-1	ea	1	1,020	600.00
Steel, reinf	lb	703,851	0.16	0.12
str	lf	1,499,000	0.205	0.22
painting	ls	job	7,495	10,000
Conc, cl B-B substr	cy	3,440	50.50	50.00
superstr	cy	1,153	79.75	55.00
subfdn for str	cy	153	41.50	22.00
cl B-B				
approach slab	cy	191	44.00	30.00
pumping sta	cy	1,540	98.00	65.00
Dampproofing	sy	2,235	1.00	0.80
Waterproofing, membrane	sy	599	3.00	3.25
Waterstop, tp 1	lf	907	3.50	4.00
tp 2	lf	482	4.00	4.50
Piling, perm steel sheet	sf	4,987	5.00	5.00
Rail, aluminum, picket tp	lf	1,884	23.00	18.00
Masonry, tp 3, cl A				
dimensioned	cf	16,102	15.60	18.00
Bronze, bearing plates	lb	380	1.75	2.00
Met misc pumping sta	lf	9,000	0.65	0.30
Drain hardware-pumping sta	ls	job	6,900	500.00
Aluminum, door, double 6'x8'	ea	1	850.00	700.00
door 7'x4'	ea	1	700.00	400.00
adj louvers 2'x2'6"	ea	2	77.00	40.00
grills	ea	2	24.00	60.00
Steel fire door 4'x7'	ea	1	1,075	400.00
MH, access, frame & covers				
pumping sta	ls	job	1,170	500.00
Waterproofing, impermeable sheeting	sy	270	6.00	3.00
Mech equip, pumping sta	ls	job	$42,000	$40,000
Elec sys, pumping sta	ls	job	27,580	25,000
Lighting, mercury, bridge	ls	job	17,760	20,000
Elec service, 4160 volts	ls	job	210.00	300.00
ducts	ls	job	9,160	10,000
Bench marks, perm	ea	1	285.00	500.00
Traffic, maint	ls	job	4,000	2,500
Adj to exist utilities	ls	job	9,975	2,000
Watermain 12"	ls	job	11,600	11,000

Liquidated damages: $300 per day

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Materials Prices

Monthly Market Quotations by ENR Field Reporters

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES—	PLATE CARBON STEEL	REINF BARS* billet	RIVETS ½-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.50	$5.30	$5.675	$12.25	.....	$110.50	$130.00	$6.975	$9.75	$6.60	.....
Chicago Area	5.50	5.30	5.675	12.25	$6.50	110.50	130.00	6.975	9.75	6.60	.....
Pittsburgh Area	5.50	5.30	5.675	12.25	6.50	110.50	130.00	6.975	9.75	6.60	$14.75
Buffalo Area	5.50	5.30	5.675	12.25	6.50	110.50	130.00	6.975	9.75	6.60	14.75
Cleveland	.....	.....	5.675	12.25	6.50	.....	.....	.....	.....	.....	14.75
Youngstown Area	.....	.....	5.675	.....	.....	.....	.....	.....	9.75	.....	.....
Geneva	5.50	5.30	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	6.20	.....	6.375	.....	6.50	.....	.....	.....	9.75	6.875	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	6.975	9.75	6.60	.....

* Fairless Works, $5.575.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Rail steel	EXPANDED METAL LATH* Per 100 sq. yd., carload lots Std. diamond mesh. 3.4 lb.	EXPANDED METAL LATH* Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	8.01–8.36*EvV*	$8.50	$	$53.00*S*	$57.00*S*	
Baltimore	9.70	9.00*T*		44.50	49.00	
Birmingham	9.00*ty*	8.51–9.94*tyV*	8.51–9.94*ty*	61.00*pK*	67.00*pK*	
Boston	8.21–9.31*K-eV*	8.75*t*	8.75*t*	49.50*K*	54.00*K*	
Chicago	7.07–8.34*uVY*	6.70–6.90*guV*	6.70–6.90*guV*	52.00*JU*	63.00‡*U*	
Cincinnati	7.64–8.91*VY*	8.16*ft*		44.50*Kg*	48.50*mnKg*	
Cleveland	7.46–8.73*uVY*	6.20*ct*		42.50*KL*	46.50*KL*	
Dallas	7.71–9.49*sr*	9.00	9.00	44.00*w*	48.50*w*	
Denver	8.24*cK*	9.35*c*		51.17*n*	56.35*n*	
Detroit	7.64–8.91*R–VbY*	7.37*Q*	11.85*Q*	67.00*O*	74.00*O*	
Kansas City	9.90*sT*	8.27*N*		51.00	55.50	
Los Angeles	8.44–9.59*dktsV*	7.35*frt*		55.00*S*	64.00*S*	
Minneapolis	7.78–8.17*usV*	9.26*T*	9.26*T*	44.50*K*	49.00*K*	
Montreal	7.90-8.60*CF*/8.20-8.90.4*tF*	7.00/7.50*FGt*	7.00/7.50*FGt*	65.70*h*	70.20*h*	
New Orleans		8.00*gkt-*		63.00*K*	69.00*K*	
New York	8.02–8.84*V-s*	8.60*tv*	8.60*y*	50.00*n*	58.00*no*	
Philadelphia	7.10–8.40-*sV*	8.43*vy*	9.30*y*	45.50‡*U*	50.00‡*U*	
Pittsburgh	7.07–8.34*vsV*	7.35*v*		58.50‡*rw*	64.50‡*rw*	
St. Louis	7.30–8.57*tzVZY*	7.35‡*tzQ*	7.35‡*tzQ*	64.00*wzK*	65.00*wzK*	
San Francisco	8.43–10.34-*sV*	9.85*jS*		53.00*S*	58.00*S*	
Seattle	8.30–10.49*aDsV*	8.85*D–*		67.00‡*nD*	73.50‡*nD*	
Toronto	9.20*H*	7.50	7.50	49.50*yqI*	44.85*qI*	

EXTRAS, per cwt: ◆Quantity (applies to LCL shipments only): under 1,000#, +$1.80; 1000–1999#, +$1.20; 2000–4999#, +90¢; 5000–9999#, +70¢; 10,000–19,999#, +50¢; 20,000–29,999#, +30¢; 30,000–39,999#, +20¢; 40,000 & up, prev. ◆ 5 tons, +70¢; 5–9 tons, +40¢; 10–19 tons, +30¢; 20–74 tons, +20¢; 75–199 tons, +15¢; 200–499 tons, +10¢; 500–999 tons, +5¢; 1000 & up, prev. ◆ Quantity (applies to LCL shipments only): under 1,000#, +$1.80; 1000–1999#, +$1.20; 2000–4999#, +90¢; 5000–9999#, +70¢; 10,000–19,999#, +50¢; 20,000–29,999#, +30¢; 30,000–39,999#, +20¢; 40,000 & up, prev. ◆ 5 tons, +70¢; 5–9 tons, +40¢; 10–19 tons, +30¢; 20–74 tons, +20¢; 75–199 tons, +15¢; 200–499 tons, +10¢; 500–999 tons, +5¢; 1000 & up, prev. ◆ Quantity extras per cwt: item: 10,000# and over, base, 5,000–9,999#, +10¢; 2,000–4,999#, +35¢; 1,000–1,999#, +85¢; 400–999#, +$1.75; under 400, +$2.50. 1000 & up, prev. ◆ Quantity extras per cwt: item: 10,000# and over, base, 5,000–9,999#, +10¢; 2,000–4,999#, +35¢; 1,000–1,999#, +85¢; 400–999#, +$1.75; under 400, +$2.50. Order: 20,000# and over, base, 10,000–19,999#, +25¢; 5,000–9,999, +65¢, 2,000–4,999, +$1.50, 1,000–1,999, +$2.50, 400–999, +$4.00, under 400, +$6.00 #9 .410, #11 +50¢ ◆Bonjour heavy, +90¢; light +$2.20 (except in New York City and surrounding metropolitan area where leveling must be done on the job) ◆Engineering details and placing from designs by others: over 500 tons, +45¢; 200–499 tons, +50¢ but not over $1500; 75–199 tons, +65¢ but not over $375; 5–19 tons, +85¢ but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only: +60¢.

4 × 18 in. No. 5 & 10 wires—Joliet, Ill., Donora, Pa., Monessen, Pa. $7.04

4 × 12 in., No. 8 & 12 wires—Joliet, Ill., Donora, Pa., Monessen, Pa. $2.62

6 × 8 in., No. 6 & 6 wires—Joliet, Ill., Donora, Pa., Monessen, Pa. $4.17

*‡ Delivered **Aver. of Canadian & American *# add 4% sales tax *a 2000–4999# *b 10,000–19,999#, fob city *c 20 tons or over *d 10,000–29,999# *e Intermediate struct'l *f Incl. delivery in free zone *g CL *h list price: dominion tax exempt; add provincial and municipal taxes *i add provincial and municipal sales taxes *j intermediate and hard grade *k fob city *l delivered; contractor to do unloading *m copper alloy *n LCL *o asphalt coated *p 500 sq. yd. or more. *q 2.5 lb *r less 2% disc. for cash *s 10,000# Item in 20,000# order *t less 1½% disc. 10 days *u add 20¢ del. *v incl 15¢ del. *w truck lots. *x add 2% sales tax *y add 15¢ del. *z add 10¢ del. *A American made. *C Canadian made. *D 1½% for cash. *E 30,000# or over. *F Federal tax exempt for bldgs. *G add 10¢ del. *H 8.85 without tariff charges. *I 3 lb $80.00. *J 4 lb $47.50. *K less 2% disc. 10 days *L F.o.b. Youngstown plant *M [illegible] *N [illegible] *O [illegible] *P [illegible] *R revised *S less 2% disc. 10th *T [illegible] *U less ½% disc. 10th prox. *V less 2% disc. 10 days *W varies according to type and size *W Chicago, Cincinnati, Cleveland, Dallas, Detroit, New York, Philadelphia, St. Louis, and Pittsburgh. *X item extras do not apply in Chicago, Cleveland, Cincinnati, Detroit, St Louis *Y 20,000# order *Z add 20¢ del.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEX*a	ASBESTOS CEMENT PIPE† per lin. ft. 6" Press Cl. 150	ASBESTOS CEMENT PIPE† per lin. ft. 12" Sew Cl. 1500	CLAY SEWER PIPE Per ft., delivered, car load ASTMC 13-55 8 in.	ASTMC 13-55 12 in.	ASTMC 200-55T 24 in.	ASTMC 200-55T 36 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTMC 4-55 6 in.	ASTMC 4-55 8 in.	CONCRETE SEWER PIPE‡b Per ft., delivered ASTMC 14-55 12 in.	ASTMC 14-55 24 in.
Atlanta	130.6	$1.52/1.69	$2.36/2.48	$0.58*r*	$1.14*r*	$4.88*r*	$12.00*r*	$200.00*rr*	$	$0.95*mKr*	$3.75*mKr*
Baltimore	140.2	1.61/1.69	2.19/2.30	.665	1.20	3.05	12.71	187.80	289.20	1.01	2.75
Birmingham	125.8	1.52/1.69	2.26/2.37	.50*r*	.95*r*	4.14*rw*	13.50*rw*	295.00*rx*	430.00*rx*	1.75*rS*	2.75*rS*
Boston	143.2	1.63/1.71	2.19/2.30	.84*qrtL*	1.55*qrtL*	6.39*rtM*	.....	244.00*r*	348.60*r*	1.56*S*	3.60*S*
Chicago	140.0	1.48/1.69	2.19/2.30	.93*rm*	1.78*rm*	7.52*rm*	21.16*rm*	220.00*Rr*	330.00*Rr*	1.30	4.00
Cincinnati	135.6	1.63/1.71	2.19/2.30	.56*Rr*	1.11*Rr*	4.50*R*	13.22*R*	177.50*R*	274.60*R*	.85*rAB*	3.25*rAB*
Cleveland	141.8	1.63/1.71	2.19/2.30	.66*BCN*	1.27*tBC*	8.47*BC*	23.45*tBC*	179.40*mBC*	276.60*mBC*	1.35	2.40*P*
Dallas	137.9	1.63/1.71	2.26/2.37	.575‡*B*	1.09‡*B*	4.75‡*B*	10.53‡*B*	.....	.....	1.27*BD*	2.95*BD*
Denver	145.1	1.71/1.80	2.36/2.48	.56*mr*	1.00*mr*	1.98*r*	.....	460.00*mr*	640.00*mr*	1.05*m*	3.50*m*
Detroit	142.1	1.63/1.71	2.19/2.30	.97*mk*	1.86*mk*	7.48*mk*	19.95*mk*	212.00*mk*	327.00*mk*	1.40*k*	5.23*k*
Kansas City	138.6	1.49/1.71	2.26/2.37	.62*r*	1.12*r*	6.32*kr*	16.86*r*	315.00*r*	625.00*r*	1.70*r*	4.25*r*
Los Angeles	148.6	1.67/1.79	2.19/2.30	.82*bl*	1.78*bS*	7.19*bS*	16.00*bS*	410.00*S*	590.00*S*	1.30*eE*	3.85*eE*
Minneapolis	145.0	1.53/1.75	2.26/2.37	1.00*aB*	1.80*aB*	7.75*aB*	.....	.....	.....	2.19*DFH*	6.31*DFH*
Montreal	132.4	.....	.....	1.13*u*	2.00*u*	7.00*u*	13.50*u*	288.00	545.00	1.17*D*	3.11*tpD*
New Orleans	132.4	1.61/1.69	2.26/2.37	.566*r*	1.078*r*	5.65*r*	.....	240.50*mr*	566.00	1.41*tlR*	3.76*tl*
New York	138.6	1.63/1.71	2.19/2.30	.94	1.76*R*	12.89	35.61	240.81	369.84	1.50‡*B*	3.60‡*B*
Philadelphia	137.9	1.61/1.69	2.19/2.30	.75‡	1.44‡	9.40‡*s*	25.57‡*s*	231.00‡	350.00‡	1.50‡*h*	5.50‡*h*
Pittsburgh	142.9	1.63/1.71	2.19/2.30	.66*K*	1.27*K*	4.95*K*	12.92*K*	190.00	295.00	1.66*DE*	3.93*DB*
St. Louis	135.7	1.48/1.69	2.26/2.37	.62*r*	1.23*r*	5.10*r*	12.95*rS*	200.00*r*	350.00*r*	1.75‡	4.05
San Francisco	148.6	1.67/1.79	2.19/2.30	.86‡*d*	1.86‡*d*	7.53‡*d*	18.00‡*d*	360.00‡	620.00‡	1.05‡*Q*	3.30‡*Q*
Seattle	149.0	1.71/1.80	2.19/2.30	.88*bk*	1.86*kb*	7.61*k*	.....	260.00*-k*	.....	1.90*ky*	4.50*ky*
Toronto	.....	.....	.....	.76*F*	1.43*r*	5.70*F*	.....	175.00*F*	290.00*F*	1.27*F*	5.19*F*

*WROUGHT STEEL PIPE (Full standard weight) Discount from list; see footnote

Mill	2½" & 3 in., Black %	2½" & 3 in., Galv. %	3½ to 6 in., Black %	3½ to 6 in., Galv. %
Lorain, Ohio	13.75	+3.50	3.25	+14.50*a*
Aliquippa, Pa	13.75	+3.50	3.25	+15.50*a*
Sparrows Pt., Md	17.25	+ List	2.25*ab*	.....
Benwood, W. Va	13.75	+3.50	3.25*ab*	+19.50*f*
Youngstown, O	13.75	+3.50	3.25*a*	+14.50*a*
Indiana Harbor, Ind	12.75	+4.50	50*dc*	+14.00
Sharon, Pa	13.75	+2.50	3.25*ab*	+13.50*ab*
Wheatland, Pa	13.75	+3.50	3.25*a*	+14.00
Etna, Pa	13.75	+3.50	50*dc*	.....
Fontana, Calif	0.75	+16.50*b*	+9.75*ab*	+27.50*ab*

*Extra quality. *† delivered. *# add 4% sales tax *a PRICE INDEXES or CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. For explanation of index see ENR Sept. 29, 1955 page 139. *b Extra strength. *c 4-in., $130. *d SS361-A. *f 21 in. *g culvert pipe; reinf., ASTM C 75–56. *h reinf., ASTM C 75–54. *i reinf., ASTM C 76–55. *j centrispun. *k ess 2% disc. for cash. *l fob plant. *m truck del. *n LCL del., fob truck. *p less 5% disc. 10th. *p freight allowed to destination in city. *u 35,000# minimum. *r less 2% disc. 10 days. *s 1 ft lengths. *u CSA A 60. *v standard strength. *w SS; add 20% for d.s. *x fob city. *y Reinforced. *z Upper value in range based on both truck lots and less than truck lots, fob city; lower value truck lots delivered. *A single strength. *B truckload. *C less 2% disc. 15th. *D ASTM 76–57. *E less 1% disc. 10 days. *F less 2% disc. 30 days. *G LCL. *H CL. *I fob origin, freight allowed. *J reinf. B14–15. *K Less 2% disc. 15 days. *L ASTM 13–57. *M ASTM 200–57. *N 2 lengths. Trucklots. *O add 2% Sales Tax. *P 18 in. *Q less 1% disc. 10th. *R revised to show carlot instead of truckld. *S ASTMC 72, 12" 1.55, 24" 4.00. *T Second price transite pipe.

† Threaded and coupled. ‡ 5 and 6 in. a 3½ to 4 in. b 6 in. d Seamless 5 in. f 6 to 1

WROUGHT STEEL PIPE, butt or continuous weld: Deduct (−) or add (+) these "discounts" from or to the following carlot list prices to get mill prices. Price per ft. (based on approx. $200 per net ton): 2½ in., 58½¢; 3 in., 78½¢; 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight for destination price.

WROUGHT IRON PIPE, lap weld: List prices per ft. same as for wrought steel pipe, but add these "discounts" to get Pittsburgh mill price. 2½ to 3 in., black 106%, galv. 139%; 4 to 6 in., black 103%; galv. 133%. Add freight for destination price.

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Jan. 19; Next, Feb. 23.
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Jan. 26; Next, Mar. 2.
- Wage Rates, Building Board, Lath, Insulation: Last, Feb. 2; Next, Mar. 2.
- Cement, Aggregate, Ready Mixed Concrete, Asphalt: Last, Feb. 9; Next, Mar. 9.

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

▲ **CONNECTICUT**—State Hy. Comr., 170 Douglas St., Hartford, Bids opened 2/6, ROADS,

Brunalli Constr. Co., 109 Summer St., Southington, Conn., LB **$2,266,998,** (8 bidders), 7,767 lin. ft. grading, drainage, c. conc. pavement on section Interstate Rte. 84, construction 4 bridges, 918 lin. ft. grading, drainage, c. conc. pavement connector from Rte. 10 to Interstate Rte. 84, construction of 2 bridges, Federal Aid Projects I-84-2(23) and U-UG-40(4) Project Nos. 131-77 and 131-76, Southington. CD 1/18/61.

BUILDINGS—LB & CA

▲ **Assembled Homes, Inc.,** 40 Holton St., Winchester, Mass., Owner Builds, **$1,000,000,** HOTEL-OFFICE, Shore Lake Quannapowitt, North Ave., WAKEFIELD, MASS. CD 10/24/60.

▲ **W. J. Megin, Inc.,** 51 Elm St., Naugatuck, Conn., CA **$2,565,500,** Wooster Square SCHOOL and Community Center, NEW HAVEN, CONN. Town, 200 Orange St., New Haven, Conn. BA 1/24, CA 2/3. CD 1/26.

▲ **Harry Bennett & Assocs.,** 770 High Ridge Rd., Stamford, Conn., Owner Builds, **$3,999,000,** 100 HOUSES, Lake Wood Park, West Trail, STAMFORD, CONN. CD 12/11/59.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., Manhasset**—BA 2/23—North Shore Hospital, Valley Rd., HOSPITAL addn. $3,000,000. Ferrenz & Taylor, 152 W. 42 St., New York 36, N. Y., archts. CD 4/14/58.

▲† **Md., Fort George G. Meade**—BA 2/28—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Zone 18, second 3 story, bsmnt., 70x144 ft. Army Medical LABORATORY, ENG-18-020-61-19. **$1,250,000. Faulkner,** Kingsbury & Stenhouse, 1710 H St. N.W., **Wash. 6,** D. C., archts.-engrs. CD 9/28/59.

▲ **N. Y., New York**—BA 3/7—New York City Housing Auth., 299 Broadway, New York 7, fdns. and general constr., heating and ventilating, electrical work, plumbing work, furnishing and installing elevators, John Adams HOUSES, Proj. NY-5-49, E. 156 St., Union Ave., E. 162 St. and Westchester Ave., Bronx Boro. Plans deposit $74 for general; $25 elevators. CD 3/5/58.

HEAVY CONSTRUCTION—LB & CA

▲ **Grove, Shepherd, Wilson & Kruge, Inc.,** 400 Madison Ave., New York 17, N. Y., and **MacLean-Grove & Co., Inc.,** 400 Madison Ave., New York 17, N. Y., LB **$9,770,000,** (5 bidders), constr. part RAPID TRANSIT RAILROAD, Section No. 12, Route No. 101, Manhattan Boro, NEW YORK, N. Y. New York City Transit Auth., Rm. 1310, 370 Jay St., Brooklyn 1, N. Y. BA 2/3. CD 12/28.

▲ **PENNSYLVANIA**—State Hy. Dpt., 206 North Office Bldg., Harrisburg, ROADS,

James Julian, Inc., 405 S. DuPont Rd., Elsmere, Wilmington, Del., CA **$1,423,531,** est. $1,800,000, (8 bidders), 31,087 ft. widening, reconstr. Rte. 1, east of Kenneth Square; 2 lanes, variable in width with 4 ft. divisor (Hy. and Bridge Authority), Chester Co.; CA **$925,568,** est. $1,165,000, 21,212 ft. widening and reconstr. Rte. 1, 2 lanes, plain con. base with bit. surf., Chester and Delaware Counties, BA 12/16. CD 12/21, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, ROADS,

No. 1 Contracting Co., Exeter Ave., West Pittston, Pa., CA **$2,526,785,** (14 bidders), 16,345 ft. RCC divided hy., 24 ft. wide each side divisor; 4 bridges; interstate; Penn-Can Hy. Sect. L.R. 1002(2), BA 12/30/60. CD 1/5/61, under LB.

▲ **MARYLAND**—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3, ROAD,

Henry C. Eastburn & Son, Inc., Newark, Del., CA **$2,368,350,** grading, drainage, surf. 3.026 mi. Beltway from Park Heights Ave. to Greenspring Ave., incl. 1-3 span and 1-4 span steel beam bridge and box culvert, Contr. B-635-17-18-82-83-420, Baltimore Co. BA 1/10, CA 2/1. CD 1/13, under LB.

▲ **MARYLAND**—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3, ROAD,

Williams Constr. Co., Golden Ring Rd. and Pulaski Hy., Baltimore 20, Md., CA **$2,189,054,** grading, drainage, surf. 2.5 mi. Beltway from Liberty Rd. to Park Heights Ave., incl. 2 bridges and 3 box culverts, Contr. B 635-16-67-68-420, Baltimore Co. CA 2/1. CD 1/26, under LB.

▲ **Baylor Construction Co.,** 360 Lexington Ave., New York City, N. Y., LB **$1,063,446,** (7 bidders), Southwest Freeway, 11th St., S. W., Connection to 12th St. EXPRESSWAY, WASH., D. C. D. C. Govt. Dpt. Hys., 499 Pennsylvania Ave. N.W., Wash., D. C. Gannett, Fleming, Corddry & Carpenter, 700 N. Front St., Harrisburg, Pa., engrs., BA 2/2/61. CD 1/10/61.

BUILDINGS—LB & CA

▲ **Avella Constr. Co.,** 215 E. 149 St., New York 51, N. Y., LB **$1,821,600,** (13 bidders), general contract EDUCATION and PRACTICE SCHOOL, BLDG. 20, incl. ground imprvts., service connections and grounds lighting, State University College of Education, CORTLAND, N. Y. State Dpt. P. Wks., State Office Bldg., Albany, N. Y. CD 3/27/57.

▲ **Blitman Constr. Corp.,** 101 Park Ave., New York 17, N. Y., CA Est. **$2,000,000,** 15 story, 237x239 ft. APARTMENT, west side of Independence Ave. between 237 and 299 Sts., Bronx Boro, NEW YORK, N. Y. River Investing Corp., 12 E. 48 St., New York 17, N. Y. CD 10/3/60.

▲ **J & H Cosden Constr. Co.,** 76 E. Palisade Ave., Englewood, N. J., Owner Builds, **$1,500,000,** 75 HOUSES, Garden St., CARLSTADT, N. J. Peter Butler, 172 State St., West Englewood, N. J., archt. Ronald B. Brown, 12 Park Ave., Rutherford, N. J., engr.

▲† **Magnus International, Inc.,** 1604 Walnut St., Phila. 3, Pa., CA **$3,061,630,** 200 units Capehart HOUSING, ENG-30-075-61-30, FORT DIX, N. J. U. S. Eng., 111 E. 16 St., New York 3, N. Y. CD 10/5/60, under LB.

▲ **Gamble & Gamble Constr. Co.,** P. O. Box 57, Bolivar, Pa., LB **$1,098,900,** (6 bidders), general contract SECONDARY SCHOOL, for Northern Cambria Jt. Sch. Dist., BARNESBORO, PA. Pa. Pub. School Bldg. Authority, 101 S. 25th St., Harrisburg, Pa. Buchart Associates, 611 W. Market St., York, Pa., archts. BA 2/2. CD 1/6.

▲ **Westinghouse Electric Corp.,** 3 Gateway Center, Pittsburgh, Pa., CA 250,000 kw. TURBINE GENERATOR, Mitchell Station, COURTNEY, PA. West Penn Power Co., Cabin Hill, Greensburg, Pa. CD 1/9/61, under CA.

▲ **Jos. Hughes & Co., Inc.,** 5 E. Franklin St., Baltimore 2, Md., LB **$3,837,000,** (9 bidders), 2 story masonry MOTOR VEHICLE HEADQUARTERS, Ritchie Hy. near GLEN BURNIE, MD. State Dpt. P. Imprvts., 301 W. Preston St., Baltimore 1, Md. Bids Jan. 5 rejected, LB $3,838,000. CD 1/11, under LB.

▲† **Norair Engineering Corp.,** 118 22nd St. N.W., Wash., D. C., LB **$3,189,000,** (14 bidders), TREATMENT and CAFETERIA BLDG., St. Elizabeths Hospital, WASH., D. C., General Services Administration, 7th & D Sts., SW, Wash., D. C., Ronald S. Senseman, 7705 Georgia Ave., NW, Wash., D. C., archt., BA 1/26/61. CD 1/20/61.

SOUTH

HEAVY CONSTRUCTION—BA

▲† **Louisiana**—BA 3/8—U. S. Eng., foot of Prytania St., New Orleans, DREDGING 36 x 260 ft. Interim Channel from Sta. 2420 plus 00 to Sta. 2800 plus 00, Mississippi River-Gulf Outlet, St. Bernard Parish. CIVENG 16-047-61-118. $2,500,000. Plans deposit $1. CD 9/20/60.

▲ **Va., Richmond**—BA 3/8—State Hwy. Dpt., 1221 E. Broad St., 15 story OFFICE, East Broad St., $4,000,000-$5,000,000. CD 11/22/60.

BUILDINGS—SLC

▲ **Ga., Atlanta**—Atlanta Americana Motor Hotel, Inc., c/o Dr. Marvin C. Goldstein 950 W. Peachtree St., soon lets contract 175,000 sq. ft. MOTOR HOTEL, $3,000,000. Extended date. CD 1/20/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Consolidated Paving Co.,** 2908½ 22nd Ave. N., St. Petersburg, Fla., CA **$917,675,** est. $1,200,000, Part 4A & 4B, interceptor lines and laterals, CA **$1,147,257,** est. $1,600,000, Part 3A & 3B, laterals for South Cross Bayou Sanitary Dist., CLEARWATER, FLA. Pinellas Co. Comrs., County Bldg., Clearwater, Fla. Grand Total $3,793,590, BA 1/12/61. CA 1/31/61. CD 1/18/61, under LB;

Paul Giuliani Constr. Co., 1941 Hampton Drive, St. Petersburg, Fla., CA **$1,067,973,** est. $1,300,000, Part 2A & 2B laterals, (Clearwater, Fla.);

Chilton Construction Co., 1008 Broadway, Duneden, Fla., CA **$539,475,** est. $550,000, Part 7, treatment plant, (Clearwater, Fla.);

Mechanical & Chemical Equipment Co., Whiteway Dr., Tampa, Fla., CA **$121,210,** est. $150,000, Part 6, pumping stations, (Clearwater, Fla.).

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort (ROAD),

R. C. Durr, Rte. 1, Walton, Ky., CA **$1,275,062,** grade, drain, 6.344 mi. Winchester-Prestonsburg, EKI-2, Clark Co. BA 10/14 CA 2/3 CD 10/18, under LB.

▲ **KENTUCKY**—Commonwealth Ky., Dpt. Hys., Frankfort, Bids opened 2/3 (ROADS),

Ky.—**Greer Bros. & Young, Inc.,** N. Main St., London, Ky., LB **$1,451,353,** (8 bidders), grade, drain 3.049 mi. Covington-Tennessee State Line. I 75-6(7) 135, Scott Co.;

Ky.—**R. B. Tyler Co.,** 1446 Levering St., Louisville 8, Ky., LB **$863,323,** (3 bidders), c. conc. pavt. 2.169 mi. Grand Ave., Newport, US 19(5) SP 19-871, Campbell Co. CD 1/19.

BUILDINGS—LB & CA

▲ **Pittsburgh Engineering & Machine Div., Pittsburgh Steel Foundry,** 564 Forbes Ave., Pittsburgh, Pa., CA, six merchant, reinforcing bars producing STEEL MILLS, CHARLOTTE, N. C. Florida Steel Corp., 215 S. Rome Ave., Tampa, Fla. Total cost **$3,300,000.** BA 1/18. CD 9/8:

Myers & Chapman, Inc., 601 Kings Dr., Charlotte, N. C., CA **$243,000,** Phase 1, STEEL ROLLING MILL, (Charlotte, N. C.).

▲ **Innanen Bros. Co.,** P.O. Box 6087, Orlando, Fla., CA Est. **$1,700,000,** 10 story APARTMENT, DAYTONA BEACH, FLA. Owner, c/o David A. Leete, archt., 116 Seabreeze Blvd., Daytona Beach, Fla.

▲ **Jehle Bros., Inc.,** P. O. Box 7128, Montgomery, Ala., CA Est. **$1,500,000,** 138,000 sq. ft. Times Square SHOPPING CENTER, ST. PETERSBURG, FLA. Sunshine State Shopping Centers, Inc., c/o Robert L. Grundman, archt., 1102 34th St. N., St. Petersburg, Fla. CD 10/28/60.

▲ **George A. Caldwell Contractor,** 622 Neosho Ave., Baton Rouge, La., LB **$1,026,322,** 2 story rein.-con. frame SENIOR HIGH SCHOOL, GRETNA, LA. Jefferson Parish School Bd., 519 Huey Long Ave., Gretna, La. BA 2/1. CD 1/18.

▲ **Gaines & Gaines,** 719 Main St., Nashville, Tenn., CA **$3,000,000,** 2,100 HOME subdivision, Dickerson Rd., NASHVILLE, TENN. Charles Wheeler, Whites Creek Pike, Nashville, Tenn. J. R. Wauford, 2835 Lebanon Rd., Nashville, Tenn., engr. CA 3/16/60. CD 7/13/59.

MIDDLE WEST

BUILDINGS—BA

▲ **Wis., Middleton**—BA 2/23—American Scientific Laboratory, Inc., 4001 N. Sherman Ave., Madison, 1 story, 160x300 ft. FACTORY-OFFICE, 6,000 sq. ft. BOILER HOUSE. Grellinger Rose & Assocs., 757 N. Broadway, Milwaukee 2, archts. CD 5/26/60.

BUILDINGS—LB & CA

▲ **Carl J. Conradt & Sons,** 591 Main St., Hamilton, O., CA **$1,021,788,** SENIOR HIGH SCHOOL, READING, O. Bd. Educ., Jefferson Ave., Reading, O. BA 1/25. CA 2/3. CD 1/30, under LB.

▲ **J. P. Cullen & Son, Inc.,** 330 E. Eastern Ave. Janesville Wis., CA **$2,117,714,** HOSPITAL addn., ROCKFORD, ILL. St. Anthony's Hospital, 1411 E. State St., Rockford, Ill. BA 1/25. CD 1/10.

Kirckof Plumbing & Heating Co., 211 SE 6th St. Rochester, Minn., heating, vent. and air-conditioning contract, St. Anthony HOSPITAL (Rockford, Ill.).

▲ **O. E. Madsen & Son, Inc.,** Sexton Bldg., Minneapolis, Minn. LB **$1,253,800,** SOCIAL STUDIES, University of Wisconsin, MADISON, WIS. Wisconsin State Agencies Bldg. Corp., Madison, Wis. BA 1/25. CD 12/20.

▲ **The Taubman Co.,** 12741 Capital Ave., Oak Park 37, Mich., CA **$5,000,000,** 1-2 story SHOPPING CENTER, parking, Washtenaw Rd. between Ann Arbor and Ypsilanti, ANN ARBOR, MICH. Chas. Gershon and John Sharemet Assocs., 4800 Greenway, Detroit 4, Mich. Louis G. Redstone Co. Inc., 10811 Puritan Ave., Detroit 38, Mich., archt. CA 1/31. CD 8/15.

▲ **E. W. Bliss Co.,** 250 Franklin St., Salem, O., CA Est. **$1,000,000,** HIGH TEMPER MILL, coil conveying equipment, ECORSE, MICH. Detroit Steel Corp., 1025 S. Oakwood St., Detroit, Mich.

MISSISSIPPI TO ROCKIES

BUILDINGS—BA

▲† **Tex., El Paso**—BA About 3/14—U. S. Eng., Box 1538, Albuquerque, N. M., five 2 story BACHELOR OFFICER'S QUARTERS, Fort Bliss, ENG-29-005-61-51, $1,000,000. CD 9/25/59.

HEAVY CONSTRUCTION—LB & CA

▲ **R. W. Moore,** 1613 Ridgewood Lane, St. Paul, Minn., CA **$1,310,212,** 69,000 lin. ft. SANITARY SEWER LINE; 86,000 lin. ft. WATER MAIN, BLOOMINGTON (P.O. MINNEAPOLIS), MINN. City, 10200 Penn Ave. S., Bloomington, Minn. BA 1/27. CD 2/1, under LB.

▲† **Atlantic, Gulf & Pacific Co.,** 15 Park Row, New York 38, N. Y., CA **$1,343,270,** DREDGING Morgan Point to Vicinity Baytown, Houston Ship Channel, Harris Co., ENG-41-243-61-27, TEXAS. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. BA 1/12. CD 1/18, under LB.

▲ **Reynolds Electrical & Engineering Co.,** 805 Early St., Santa Fe, N. M., CA **$2,000,000,** (5 bidders), 70 mi. 230,000 volt TRANSMISSION LINES, bet. Albuquerque and Ambrosia Lake, near Gallup, NEW MEXICO, Public Service Co. of New Mexico, 424 Central Ave., S. E., Albuquerque, N. M. BA 1/17/61. CA 1/17/61.

BUILDINGS—LB & CA

▲ **Suburban Building Co. Inc.,** c/o Dal Dunlap, 434 Joe St., Kirkwood 22, Mo., Owner Builds **$1,500,000,** 48 RESIDENCES, Dunmorr's Subdivision Ballas Rd. between Manchester and Clayton Rds., DES PERES (ST. LOUIS 31 P. O.), MO. CD 1/16.

▲ **Robert E. McGee, General Contractor, Inc.,** Box 562, El Paso, Tex., CA **$1,173,630,** elementary SCHOOL, No. 1, Andrews, Sun Valley Drive and Mackinaw Sts., EL PASO, TEX. El Paso Ind. School Dist., El Paso, Tex. Kuykendall & McCombs, 5801 Trowbridge St., El Paso, Tex., archts. CD 11/3/60.

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▲ **Wm. J. Alexander Co.,** 6125 Carson Rd., Houston, Tex. Owner builds **$1,053,000,** 90 DWELLINGS, Red Bluff Rd., at Orrell St., PASADENA, TEX.

▲† **R. F. Ball Constr. Co., Inc.,** P. O. Box 2300, San Antonio, Tex., CA **$2,627,888,** 170 Capehart HOUSING UNITS, Brooks Air Force Base, IFB 41-609-61-50, SAN ANTONIO, TEX. School of Aviation, Brooks Air Force Base, San Antonio, Tex. BA 11/30. CD 12/12, under LB.

▲ **Newton Constr. Co., Inc.,** Box 4108, Odessa, Tex., CA **$1,400,000,** masonry high SCHOOL, CARLSBAD, N. M. Bd. Education, Carlsbad, N. M. BA 1/24/61. CD 1/31/61.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., Los Angeles**—BA 3/10—Los Angeles County Flood Control Dist., 2250 Alcazar St., STORM DRAIN, Proj. 57, Unit 3, Lines A, B, D, E, F and G, Arroyo De La Sacatela Storm Drain Sys. $8,000,000. CD 11/10/58.

BUILDINGS—BA

▲ **Calif., Los Angeles**—BA 3/1—Los Angeles Co., 108 W.2 St., Los Angeles, Santa Monica BOY'S PROBATION CAMP, 433 S. Encinal Rd.; Cornell, $1,130,665. Plans deposit $50. CD 1/6/61.

BUILDINGS—SLC

▲ **Hawaii, Waikiki**—Queen Development Co., 627 South St., Honolulu, HOTEL Lava, 1st Increment, Proj. 6036, soon lets contract. Total cost $2,500,000. Takashi Anbe, 1451 S. King St., Honolulu, Hawaii, archt. CD 9/28/60.

HEAVY CONSTRUCTION—LB & CA

▲† **Fredericksen & Kasler,** 212 13 St., Sacramento, Calif., LB **$1,133,030,** est. $1,073,912, (6 bidders) imprv. East Twin CREEK, upstream from Marshall Blvd., Santa Ana River Basin, San Bernardino, CIVENG-04-353-61-12, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. BA 2/1/61. CD 1/10/61.

▲ **Weeshoff Constr. Co., Globe Contr Co. and B & P Trucking Co.,** 902 S. Santa Fe Ave., Los Angeles, Calif., CA **$1,141,510,** Proj. 481 Echo Park Ave STORM DRAIN; Proj. 491 Beachwood Dr. STORM DRAIN, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 1/20/61. CD 1/27/61, under LB.

BUILDINGS—LB & CA

▲ **Carl N. Swenson, Inc.,** 1095 Stockton Ave., San Jose, Calif., CA **$2,901,400,** (12 bidders), Yuba COLLEGE, LINDA, CALIF. Yuba College Trustees, Linda, Calif. BA 2/2, CA 2/4. CD 1/13/61.

▲ **Cunningham Co.,** 10950 Dale St., Stanton, Calif., Owner Builds, **$1,352,000,** 1,110 stucco DWELLINGS, Tract 3844, WESTMINSTER, CALIF. Richard Leitch, 410 W. Coast Hy., Newport Beach, Calif., archt.

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **T. C. Gorman (Nova Scotia) Ltd.,** 441 Rainnie Dr., Halifax, N. S., CA **$2,096,813,** (3 bidders), 2,300 ft. rein.-conc. marginal type WHARF, supported on concrete beams and piles, North Shore St. John's Harbor, ST. JOHN'S, NEWFOUNDLAND, Dpt. P. Wks. Hunter Bldg., Ottawa, Ont. BA 1/18. CD 1/24, under LB.

BUILDINGS—LB & CA

▲ **W. B. Sullivan Constr. Ltd.,** Box 40, O'Connor Postal Station, Toronto, Ont., LB **$1,179,619,** brick, cut stone with granite slab facing, steel framing, air-conditioned COURT AND POLICE HEADQUARTERS, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. BA 1/31. CD 1/13.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Ont., Ottawa**—City, City Hall, SEWAGE TREATMENT PLANT, **$1,000,000;** interceptor and outfall sewers, **$5,300,000;** main. bldg. and structures for treatment plant, **$3,422,000.** James F. MacLaren Assocs., 321 Bloor St. E., Toronto, consult. engrs. CD 8/24/49.

EARTHWORK, WATERWAYS

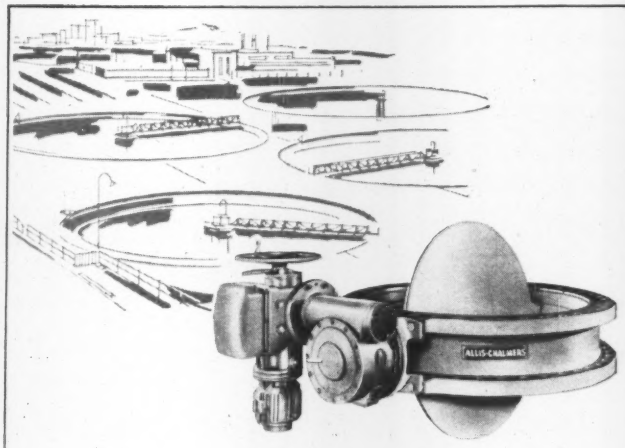
† **Idaho, Arco**—Atomic Energy Comn., Idaho Operations Office, Idaho Falls, BERYLLIUM OXIDE REACTOR experiment (BORE) to provide data on gas cooled reactors for civilian use at National Reactor Test Station. General Atomic Div., General Dynamics Corp., 10955 John Jay Hopkins Dr., San Diego, will design constr. and test operate. **$7,000,000.** Atomic Energy Comn., 2111 Bancroft Way, Berkeley, Calif., will accept bids until Feb. 20 for architect-engineers to submit proposals for design and engineering services. CD 7/29/59.

PUBLIC BUILDINGS

▲ **Conn., Wethersfield**—Town, Town Hall, plans by Jeter Cook, 36 Pearl St., Hartford, Junior High SCHOOL, Wells Rd., **$1,400,000.** Loomis & Loomis, 252 Broad St., Windsor, Conn., consult. engrs., Van Zelm, Heywood & Shadford, 1007 Farmington Ave.,

(Continued on page 104)

ALLIS-CHALMERS



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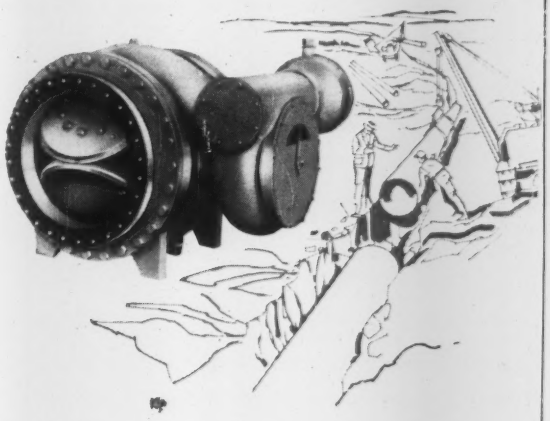

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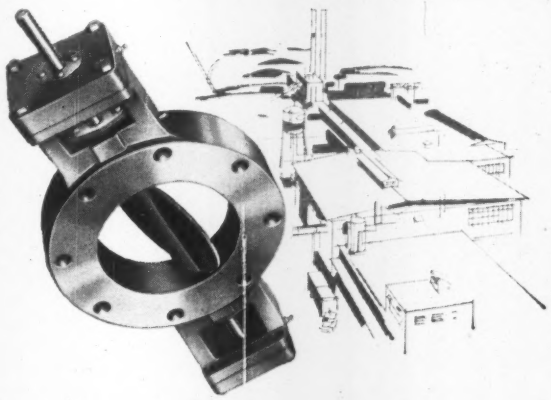

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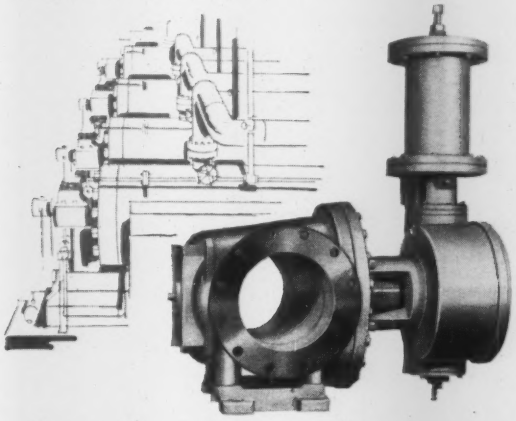

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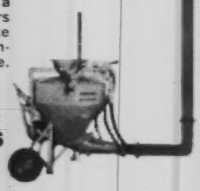

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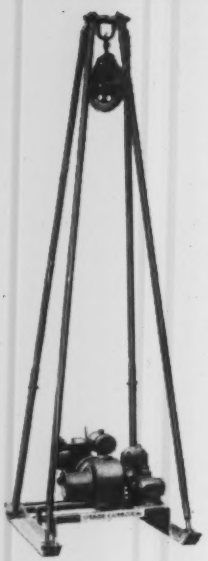

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(Continued from page 100)

West Hartford, Conn., mech. engrs. Charles A. Currier Assocs., 740 N. Main St., West Hartford, Conn., site engrs. CD 11/15/60.

▲ **Ga., Atlanta**—Fulton Co. School Dpt., 786 Cleveland Ave., SW, voted $3,300,000 bonds Jan. 24, SCHOOLS, $5,700,000. CD 12/22/60.

▲† **Ill., Lemont**—Atomic Energy Comn., Bailey and Bluff Rds., plans by Skidmore, Owings & Merrill, 30 W. Monroe St., Chicago, Zone 3, rein.-conc. LABORATORY, Argonne National Laboratory, $1,500,000. Bids Spring 1961.

▲ **Mich., Bloomfield Hills**—Bd. Educ., 4200 Andover St., voted $4,135,000 bonds Jan. 30, SENIOR HIGH SCHOOL addn. $1,000,000; JUNIOR HIGH SCHOOL. Over $1,590,000. CD 1/13.

▲ **N. J., Cranford**—Bd. Educ. Cranford Twp., Central Ave., referendum bonds and project Feb. 14, SENIOR HIGH SCHOOL. $3,000,000; JUNIOR HIGH SCHOOL. $2,500,000. Epple & Seaman, 901 Broad St., Newark, N. J., archts. CD 1/23.

▲ **N. J., Roselle Park**—Bd. Educ. Boro Roselle Park, 30 W. Clay Ave., referendum bonds and project Mar. 14, HIGH SCHOOL, Webster Ave. $2,500,000. Emil Schmidlin, 50 Evergreen Pl., East Orange, N. J., archt. CD 1/21.

▲ **N. Y., New York**—Bureau Constr., Bd. Educ., 45-12 Crescent St., Long Island City plans by Francis J. Goldberg, 227 Prospect Ave., Cedarhurst, N. Y. and Paul R. Williams, 3757 Wilshire Blvd., Los Angeles, Calif., Proj. E-459, P.S. 154, 3 story ELEMENTARY SCHOOL, W. 126 St. between 7 and 8 Aves., Manhattan Boro. $2,400,000. Strobel & Rongved, 70 W. 40 St., New York 18, N. Y., structural engrs. Kaolun & Mayer, 31 Union Square, New York 3, N. Y., mechanical engrs. Bids February-March. CD 4/5/60.

▲ **N. Y., West Babylon**—Union Free School Dist. No 2, Great East Neck Rd., plans by Knappe & Johnson, 2 Overhill Rd., Scarsdale, N. Y., 2 story Tooker Ave. ELEMENTARY SCHOOL. $1,800,600. Albert Fentzlaff, Inc., 111 Broadway, New York 6, N. Y., mechanical engr. Fraioli-Blum-Yesselman, 250 E. 43 St., New York 17, N. Y., structural engrs. Bids late March 1961. CD 10/21.

▲ **N. Y., Westbury**—Bd. Educ., Hitchcock Lane and Jericho Turnpike, voted $2,096,000 referendum Jan. 28, Park Ave. ELEMENTARY SCHOOL. $1,045,000; Drexel Ave. SCHOOL addn. $458,000. Eggers & Higgins, 101 Park Ave., New York 17, N. Y., archts.

▲ **N. C., Wilson**—Bd. Comrs. Wilson Co., Courthouse, plans by Walter Hook & Assocs., 303½ W. 4th St., Charlotte, and B. Atwood Skinner, 509 Raleigh Rd., Wilson, Wilson County HOSPITAL, $3,250,000. CD 11/29.

▲ **O., Columbus**—Dpt. P. Wks., State Depts. Bldg., Zone 15, remodeling BOTANY ZOOLOGY bldg., Ohio State University, $1,481,400. Barrett Associated Engineers Ltd., 1500 W. 1st St., Columbus, consult. engrs. CD 8/7/59.

▲ **Okla., Tulsa**—General Services Admin., 19th and F Sts., NW, Wash., D. C., plans by Donald McCormick, 1579 E. 21st St., Black & West, Tri State Bldg. and Leon B. Senter & Assocs., Philtower Bldg., Tulsa, FEDERAL OFFICE, $10,500,000 (No appropriation). CD 2/4/60.

▲ **Ore., Corvallis**—Bd. Higher Educ., Box 5175, Eugene, plans by Hamlin & Martin, 159 W. 12th St., 4 story bsmnt. 127,700 sq. ft. LIBRARY, Oregon State College, $2,300,000. CD 5/18/60.

▲ **Tex., San Antonio**—Bexar Co., Courthouse, voted bonds $5,000,000, TEACHING SCHOOL, Robert B. Green Hospital, $1,500,000. CD 10/29/58.

▲ **Wis., Wood**—Veterans Admin. Design Service, Munitions Bldg., Wash., 25, D. C., plans by Brust & Brust, 1212 W. Wisconsin Ave., Milwaukee, Zone 3 and Urbahn, Brayton & Burrows, 635 Madison Ave., New York, N. Y., 10 story 90,000 sq. ft. H-shaped VETERANS HOSPITAL, $22,000,000. CD 3/14/56.

▲ **B. C., Langley**—Langley Memorial Hospital, Langley, plans by Gardiner, Thornton, Gathe & Assocs., 1520 Alberni St., 100 bed HOSPITAL, $2,760,020, Read, Jones, Christoffersen, 1161 Melville St., consult. engrs. CD 11/18/53 under Town, Town Hall as owners.

▲ **B. C., Vancouver**—Vancouver General Hospital, 12th and Heather Sts., plans by Townley & Matheson, 1376 Hornby St., 6 story GYNECOLOGICAL AND OBSTETRICAL HOSPITAL renovations, Laurel Pavilion, 12th Ave. and Laurel St., $2,000,000. CD 8/29/47.

COMMERCIAL BUILDINGS

▲ **Calif., Hollywood**—John B. Kilroy & Assoc., 5657 Wilshire Blvd., Los Angeles, Calif., plans by Cejay Parsons, 300 S. Hobart St., Los Angeles, Calif., 11 buildings, incl. OFFICES, MOTEL, GARAGE, HELIPORT, PARKING, Hollywood Freeway, Barnham and Lankershim Blvds. $18,000,000.

▲ **Calif., Palo Alto** — Stanford University, plans by Spencer & Lee, 251 Kearny St., San Francisco, Calif., 73,000 sq. ft. Tresidder Memorial UNION STUDENT CENTER. $2,700,000. Bids in Spring. CD 10/19/55.

▲ **Fla., Tampa**—St. Joseph's Hospital, 7 Ave. and Morgan St., plans by William Harvard Blanchard Jolly Assocs., 2714 Ninth St., N. St. Petersburg, 500-bed HOSPITAL, Habana and Buffalo Sts., $6,000,000. CD 7/25/59.

▲ **N. H., Laconia**—Keewayden Shores, Inc., P. O. Box No. 603, Meredith, plans by Associated Architects, Henry W. Erickson, 51 Church St.; and John G. Danielson, 19 Winchester Drive, Lexington, Mass., 500 unit Garden type APARTMENT, Blueberry Lane, $4,000,000.

▲ **Minn., St. Paul**—National Redevelopment Corp., c/o Richard Keller, archt., Superior Bldg., Cleveland, O.,

(2nd Phase), two 300 unit each APARTMENTS, Fuller Rd. and Louis Marion Parkway. $2,500,000.

▲ **N. J., Freehold**—Olympia, Inc., 666 5 Ave., New York 19, N. Y., plans by Chapman, Evans & Delehanty, 50 Broadway, New York 4, N. Y., 14 story APARTMENT, theatre, library and geriatric research center for elderly, off Rte. 33, Manalapan Twp. $15,000,000-$18,000,000. CD 8/4/60.

▲ **N. Y., Brooklyn**—Shapco Builders, Inc., 20 E. 46 St., New York Zone 7, plans by Herbert & Clarence Lilien, 1841 Broadway, New York 23, N. Y., 14 story 180 x 240 ft. APARTMENT, Ocean Parkway between Avenue M and Avenue N. $3,000,000. CD 1/13.

▲ **N. Y., New York**—Arnold Praver Assocs., 163-18 Jamaica Ave., Jamaica 32, N. Y., plans by Paul & Jarmul, 89-51 164 St., Jamaica, N. Y., 20 story APARTMENT northwest corner 1681-1689 Second Ave. $2,000,000. Charles Wurmfeld, 150 Nassau St., New York 38, N. Y., mechanical engr. Abrahams, Hertzberg & Cantor, 207 E. 37 St., New York 16, N. Y., structural engrs. To go ahead Spring 1961. CD 10/26/60.

▲ **N. Y., New Rochelle**—Sachar Development Corp., 598 Madison Ave., New York 22, N. Y., plans by S. J. Kessler & Sons, 598 Madison Ave., New York 22, N. Y., 6 story APARTMENT, Pelham Rd. $4,500,000.

▲ **N. Y., Sterling Forest**—Owners, c/o Elliot M. Weiner and Benjamin Harris, 500 Broadway, Newburgh, N. Y., Alwin Cassens Jr., 145 So. Franklin Ave., Valley Stream, N. Y. and Herman York, 90-04 161 St., Jamaica, N. Y., 200 HOMES, Laurel Ridge Area. About $4,000,000. To go ahead March 15.

▲ **O., Columbus** — Owner, c/o Tibbals-Crumley-Musson, archts., 965 E. Broad St., 300 room MOTOR HOTEL, 15 story, 150,000 sq. ft. OFFICE, swimming pool, 100 car parking, $8,500,000. Bids 6/61.

▲ **O., Fairborn**—Arthur G. Roehner, 827 Mitman Dr., 750 HOMES, Dayton-Yellow Spring Rd., Rona Hills -$13,500,000.

▲ **O., Parma**—Pittsburgh Exarchate Byzantine Catholic Church, 54 Riverview Ave., Pittsburgh, Pa., plans by John Lipaj & Assocs., The Arcade, Cleevland, Zone 14, COLLEGE, SEMINARY, ADMINISTRATIVE UNITS, addnl. CHURCH, Carlton Rd., $15,000,000.

▲ **Tenn., Nashville**—Baptist Hospital, 20th. & Church, Nashville, plans by Hart, Freeland & Roberts, 3rd. Nat'l. Bank Bldg., 14 story, 250 bed HOSPITAL, $8,000,000. To go ahead in 1963. CD 3/17/54.

▲ **Wash., Tacoma** — Kingston House Management Co., Inc., 220 S. Tacoma Ave., plans by Worthern, Wing, Seifert & Forbes, 925 S. Tacoma Ave., 8 story, 110x230 ft. rein.-con. RETIREMENT HOUSE, $3,000,000. Constr. this Summer.

▲ **B. C., Fort St. John**—Sisters of Charity of Providence, plans by Gardiner, Thornton, Gathe & Assocs., 1520 Alberni St., Vancouver, 2 and 3 story, bsmnt, brick, HOSPITAL, $1,700,000. Read Jones, Christoffersen, 1161 Melville St., Vancouver, consult. engrs. CD 9/17/59.

▲ **B. C., Victoria**—Sisters of St. Anne, Humboldt St., plans by Gardiner, Thornton, Gathe & Assocs., 1520 Alberni St., Vancouver, 5 story St. Joseph's HOSPITAL WING, $2,300,000.

▲ **Ont., Toronto** — Wellesley General Hospital, 160 Wellesley St. E., plans by Herbert Agnew, 25 Merton St., HOSPITAL addn., $2,000,000.

INDUSTRIAL BUILDINGS

▲ **Minn., South St. Paul**—Swift & Co., 4115 S. Packers St., Chicago, Ill., PACKING PLANT. $1,000,000. Bids soon.

▲ **O., Independence**—Thompson-Ramo Wooldridge, Inc., 23555 Euclid Ave., Cleveland, Zone 17, 320,000 ft. WAREHOUSE 50,000 ft. OFFICE, Pleasant Valley Rd., just east of Rte. 21, $3,000,000.

▲ **Tex., Fort Worth**—Carling Brewing Co., 9300 Quincy Ave., Cleveland, Zone 6, O., BREWERY, Everman Industrial Park, $20,000,000.

▲ **Tex., Port Arthur**—Port Gas & Processing Co., (Div of Hudson Gas & Oil Corp.) 761 Pierremont St., gas processing PLANT, $3,500,000; repair shop, $200,000; short gas lines, $125,000. Bids Feb. 1961.

▲ **Ont., Smith Falls**—The Hershey Chocolate Corp., 19 E. Chocolate Ave., Hershey, Pa., U. S. A. chocolate PLANT, Lorne St. E., $7,000,000. Day & Zimmerman, 1700 Sansom St., Philadelphia, Pa., U. S. A. and Surveyer, Nenniger & Chenevert, 1440 St. Catherine St., W., Montreal, Que., consult. engrs. CD 10/12.

▲ **Ont., Toronto**—Coca-Cola Ltd., 90 Broadview Ave. plans by Mathers & Haldenby, 10 St. Mary St., PLANT, Overlea Blvd., $2,000,000. CD 9/16.

▲ **Sask., Saskatoon**—Interprovincial Cooperatives Ltd., 212 22nd St. E., CHEMICAL PLANT inc herbicide plant, approx. $1,750,000, formulating plant, approx. $1,000,000, chlorine-caustic plant $2,000,000 to $3,000,000. D. B. Bohna & Co., Ltd., 875 W. Broadway, Vancouver B. C., consult. engrs. CD 2/3/61.

LATIN AMERICA

▲ **Honduras**—Empresa Nacional de Energia Electrica, Apartado Postal 99, Tegucigalpa, D. C., Honduras, Canaveral HYDRO ELECTRIC Project near Lake Yojoa. Harza Eng. Co., 400 W. Madison St., Chicago 6, Ill., U. S. A., consult. engr. Bidding documents will be ready the end of February and may be obtained from owner or engineer. Bidders must prequalify. CD 7/19/60.

TESTS PROVE:

NEW JOINTING MATERIAL LASTS LONGER THAN SUBSTITUTE PIPE

Lifetime Vitrified Clay Pipe—which is chemically inert and can't be damaged by gases and acids normally found in sewer lines—has been the standard of excellence for centuries.

But how about the new resilient jointing materials now being used on Clay Pipe? How do they stand up under acid attack?

Samples of standard jointing material have been suspended in sewer lines in cities all over the country to see how they react to normal exposure. But we wanted to find out quickly if they stand up to sulphuric acid—the number one killer of sanitary sewer lines built of substitute pipe.

In one test, samples of cement-asbestos, concrete and clay pipe and five jointing materials were weighed dry, then exposed to a five-percent sulphuric acid solution for 100 days. They were then removed from the acid, dried, and weighed again to observe weight loss and disintegration.

The results were amazing!

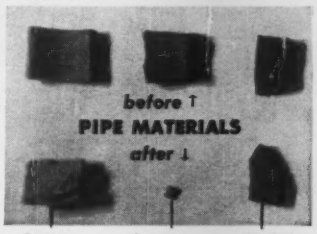
The sample of concrete pipe was completely disintegrated. The sample of cement-asbestos pipe was badly laminated and almost disintegrated.

But there was no evidence of any deterioration of either the jointing materials or, naturally, the Vitrified Clay Pipe.

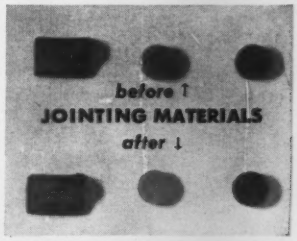
Get all the facts* before you specify any kind of pipe for your community's sewer line. There's no substitute for lifetime Vitrified Clay Pipe with the new compression joints.

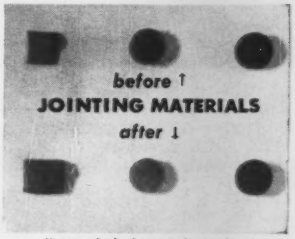
**Further explanation of this experiment is available on request.*

Pipe and jointing materials after 100 days exposure in 5% Sulphuric Acid Solution



6 NEW JOINTING MATERIALS





Unretouched photographs made at the NCPMI Research Laboratory

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Ave., Washington, D. C.

Please send me full details on the new factory-made compression joints on Clay Pipe.

(name)

(company)

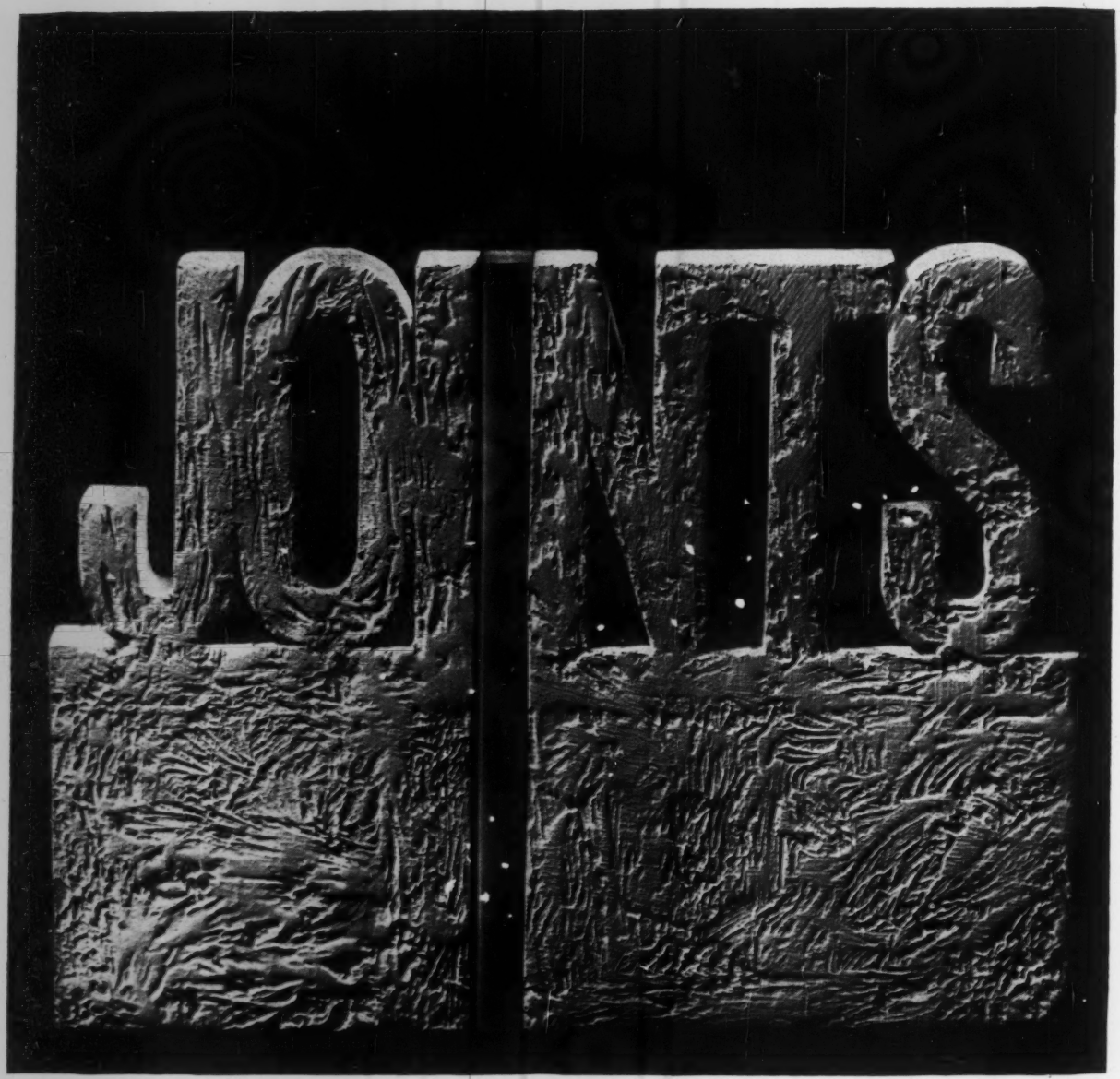
(street address)

(city and state)

B-2C23 EN

COMPRESSION SEALED, VITRIFIED CLAY PIPE
IMPERVIOUS
THE STANDARD in SANITARY SEWERS

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Avenue Washington 6, D. C.



No building is better than its weakest joint—or the material used to make it watertight ■ Sealant based on THIOKOL liquid polysulfide polymer does more than fill joints and shed water... it adds structural strength, unique among caulking compounds ■ Custom-applied to the job on the job, polysulfide-type sealant conforms automatically to all joints regardless of size or shape. No cutting, no splicing, no vulcanizing, no compression is ever required to produce and maintain a watertight seal. Worrisome departures from original joint design which inevitably occur between drafting board and construction site can be compensated for instantly ■ Sealant containing THIOKOL polysulfide polymer welds itself chemically to all building materials in any combination. Expansion up to 100% cannot break its steel-grip bond, while its outstanding resistance to sun, freezing, moisture, ozone, chemicals and aging assures trouble-free weatherproofing for extended periods of time ■ ASA Specification A 116.1 sets quality and performance standards for polysulfide-type sealant. Make it your guide on your next assignment. There is only one polysulfide polymer. And it's produced by Thiokol.

Thiokol®
CHEMICAL CORPORATION
780 N. Clinton Ave., Trenton 7, N. J.
In Canada: Naugatuck Chemicals Division, Dominion Rubber Company, Elmira, Ontario

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲† **Rhode Island**—BA On Or About 4/11—U. S. Eng., 187 Westminster St., Providence, FOX POINT HURRICANE BARRIER, (1) river excavation, (2) rock-faced embankment, dikes, (3) cofferdams, (4) driving steel bearing, steel sheet, round timber, cast-in-place con., and wood sheet cut-off piling, (5) concrete structures, incl. pumping station substructure, river barriers and river gate structure, (6) pumping station, steel framed brick masonry superstructure, and accessories, (7) installation of govt. furnished equipment, incl. five 120 in. pumps and motors, load center, switchgear, and transformers, (8) river gate sect. with 3-25 x 40 ft. training gates, (9) two cooling water gates, (10) vehicular street gates, ENG-19-016-61-23, $9,000,000. CD 1/16/61.

BUILDINGS—LB & CA

▲ **Keewayden Shores, Inc.**, P.O. Box 603, Meredith, N. H., Owner Builds, $4,000,000, Garden Type APARTMENT HOUSES, Blueberry Lane, LACONIA, N. H. Henry W. Erickson, 51 Church St., Laconia, and John G. Danielson, 19 Winchester Dr., Lexington, Mass., archts. CD 2/6/61.

▲ **United Engineers & Contractors, Inc.**, 1401 Arch St., Phila., Pa., CA Est. $15,000,000, second unit, ELECTRIC POWER PLANT, Keyser Island, Norwalk Harbor, NORWALK, CONN. Connecticut Light & Power Co., Selden St., Berlin, Conn. Kahn & Jacobs, 2 Park Ave., New York, N. Y, archts.-consult. engrs. CD 6/4/59.

MIDDLE ATLANTIC

BUILDINGS—LB & CA

▲ **Volpe Constr. Co.**, 261 Constitution Ave. N.W., Wash., D. C., CA $6,239,000, 150-bed HOSPITAL, Forest Glen Rd. and Georgia Ave., WHEATON, MD. Sisters of the Holy Cross, Eastern Ave. and Bunker Hill Rd. N.E., Wash., D. C. BA 1/17. CD 1/20/61, under LB.

MIDDLE WEST

BUILDINGS—BA

▲ **Wis., Madison**—BA 4/6—Wisconsin State Bldg. Corp., Madison, 8 story, 80x460 ft. and 2 story 80x260 ft. STATE OFFICE. $14,000,000. Plans deposit $100. Grassold-Johnson & Assocs., 734 N. Jefferson St., Milwaukee, Zone 2, archts. R. D. Culbertson, state engr. CD 3/10/60.

▲ **C., Cleveland**—BA 5/2—Veterans Admin., Munition Bldg., Wash., D. C., 800 bed G. M. & S. HOSPITAL and Regional OFFICE MEDICAL CLINICS, Veterans Admin., E. 105th St. and E. Blvd., Wade Park, $19,000,000. Dalton-Dalton Assoc., Smith Hinchman & Grylls Assoc., Inc., 3107 W. Grand Blvd., Detroit 2, Mich., archts. CD 8/19/60.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15, Bids opened 1/31, ROADS,

O.—**Traylor Bros., Inc.**, Station B, Box 6066, Evansville Ind., LB $5,049,788, est. $5,057,500, (3 bidders), Type T 71, structures 4.859 mi. USR 52-7.90, U-F-393(10) City of Ironton, Village of Coal Grove, Proj. 2, Lawrence Co.;

O.—**Funk Constr. Co.**, 12 S. Main St., New London, O., LB $278,301, est. $314,800, (8 bidders), Type T 35 on B 19 and structures, 1.027 mi. State Rte. 511 (4.65) (13.08) 5.83 (Parts Nos. 1, 2 and 3) Proj. 13, Lorain Co. CD 1/6/61.

BUILDINGS—LB & CA

▲ **George A. Fuller Co.**, 597 Madison Ave., New York, N. Y., CA Est. over $5,000,000, (2 bidders), 500,000 sq. ft. PLANT, MENTOR, O. W. S. Tyler Co., 3615 Superior Ave., Cleveland 14, O. CD 7/25/60, under CA.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲† **Kansas**—BA 2/24—U. S. Eng., P.O. Box 61, Tulsa 2, Okla., SPILLWAY and COMPLETION EMBANKMENT, John Redmond Dam, Grand (Neosho) River, ENG-34-066-61-53. $10,000,000. CD 1/11/61.

▲† **Texas**—BA About 3/14—U. S. Eng., Box 1600, Fort Worth, gated rein.-con. SPILLWAY, Waco Reservoir, ENG-41-443-61-65. $6,000,000. CD 9/28/59.

▲† **New Mexico**—BA About 3/21—U. S. Eng., P.O. Box 1538, Albuquerque, Two Rivers RESERVOIR PROJ., Chaves Co., Rio Hondo, Roswell, ENG-29-005-61-9. $5,500,000. CD 9/21/60.

BUILDINGS—BA

▲ **Tex., Dallas**—BA 3/1—Southwestern Bell Telephone Co., 308 S. Akard (selected list of bidders), 23 story, 2 bsmnt., 2 penthouses, brick, granite, tile, cut stone A/C OFFICE. $8,750,000. Thomas Jameson & Merrill, 820 N. Harwood, archts.-engrs. Chas. G. Tarbell, c/o owner, owners ch. engr. CD 5/20/60.

▲† **Neb., Fort Crook**—BA 3/15—Base Procurement Office, Offutt Air Force Base, Fort Crook, 500 units, CAPEHART HOUSING No. 4. $8,250,000. Henningson, Durham & Richardson, Steele, Sandhorn & Weinstein, 252 Aquilla St., Omaha, Zone 2, archts. CD 11/15/60.

BUILDINGS—LB & CA

▲ **Henger Constr. Co.**, Simons Blvd., Dallas, Tex., CA Est. $4,000,000, 19 story, 140 units APARTMENT; CA Est. $5,000,000, 22 story HOTEL, DALLAS, TEX. Carey-Schneider Investment Co., 819 Republic Nat'l. Bank Bldg., Dallas, Tex. Harrell & Hamilton, 819 Republic Nat'l. Bank Bldg., Dallas, Tex., archts.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Bids opened 2/2, ROAD,

W. F. **Maxwell**, P.O. Box 356, Fontana, Calif. and **Matich Constr. Co.**, P.O. Box 390, Colton, Calif., LB $6,839,180, (4 bidders), grading, paving to constr. 5.8 mi. six lane freeway U.S. Hy. 70-99, incl. 11 bridges between jct. Riverside Freeway south of San Bernardino and Colton Ave., Redlands, San Bernardino Co. CD 12/22/60.

BUILDINGS—LB & CA

▲ **Haas & Haynie**, 244 Pine St., San Francisco, Calif., CA Est. $5,000,000, RESORT HOTEL, GOLF COURSE, ISLAND OF HAWAII, HAWAII. Laurence S. Rockefeller, c/o John Carl Warnecke & Assocs., archts., 111 New Montgomery St., San Francisco, Calif.

CANADA

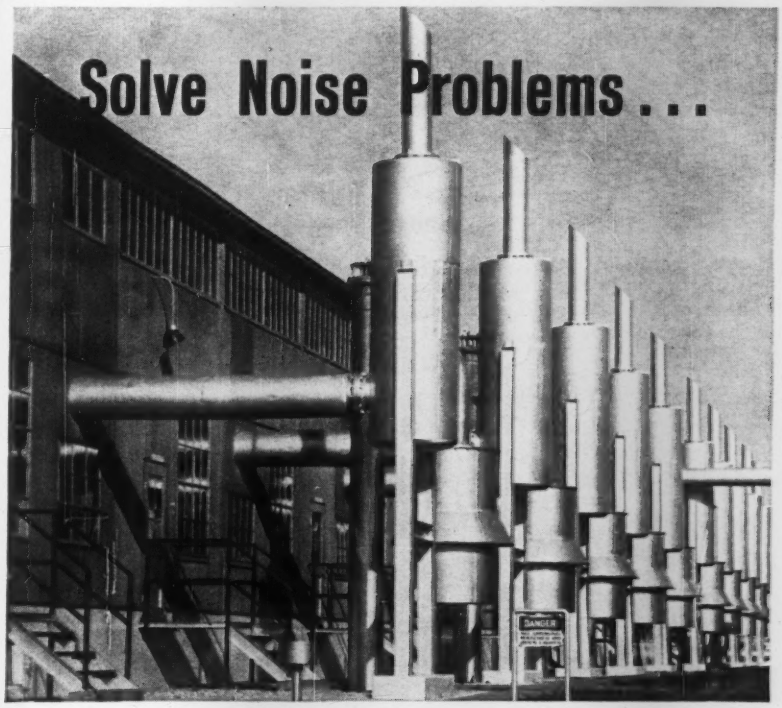
BUILDINGS—LB & CA

▲ **Quemont Constr. Co.**, 6655 Cote des Neiges Rd. and **Charles Duranceau Ltd.**, 2545 Jacques Hertel St., Montreal, Que., LB $7,333,200, first phase CONCERT HALL, LaGrande Salle plaza and part of garage below plaza, St. Catherine St. W. MONTREAL, QUE. Sir George Etienne Cartier Corp., 3819 Calixa-Lavalee Ave., Montreal, Que. BA 2/3/61. CD 1/9/61.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **ARGENTINA**—BA 3/15—Direccion Nacional de Vialdad (National Bureau Hys.), Sals de Licitaciones, Maipa 3, Planta Boja, Buenos Aires, ROAD,
225 mi. roads, bridge over Rio Colorado, LaPampa and Rio Negro. $10,000,000.



. . . with a **MAXIM ENGINEER** on your team

There's no need to go-it-alone when your design problem deals with noise suppression. You can save time and money by putting a MAXIM engineer on your team.

He is a specialist in designing silencers to meet noise problems of all types of engines from giant diesels to "go-karts," as well as special purpose silencers for jet aircraft, atomic submarines, waste disposal plants, chemical plants and heat recovery applications.

Let us know your problems . . . we will work with your engineers . . . on your team . . . to solve them.

Immediate delivery on most standard type silencers from regional stocking points. Write or call today.

MAXIM BEAIRD DIVISION

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A Subsidiary of American Machine & Foundry Company

Headquarters: P. O. Box 1115 Shreveport, Louisiana

Plants: Shreveport, Louisiana Clinton, Iowa

Sales agents in all principal cities and foreign countries.

Union Wire Rope

Super strong! Super tough! Gives you fullest measure

Mangled in a Wedge Socket

Here's a result of improper socketing. It was caused by using a poorly designed or worn-out wedge socket. Failure at the dead end can damage other sections of the rope, too.

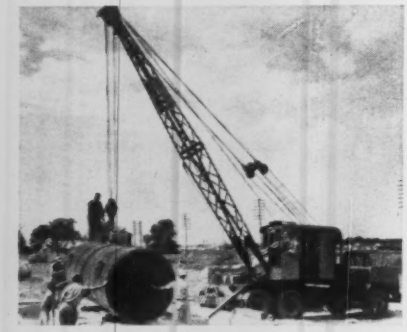
Rusty Road to Ruin

Rust—No. 1 enemy of steel—takes a heavy toll in wire rope life. An insidious, silent type of killer, rust often does irreparable damage before it's even noticed. The one-strand break shown here resulted when the rope was allowed to become rust-bound through lack of lubrication. Tests show that, with other conditions ideal, properly lubricated rope has up to 10 times the life expectancy of dry rope.

Union Tuffy's on the job • Some of the popular types and uses

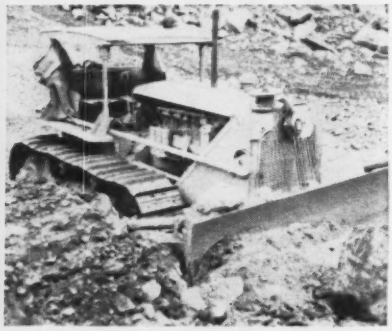
Tuffy Scraper Rope

Flexible enough to take sharp bends; stiff enough to resist looping and kinking when slack; highly resistant to the shock of load impact — that's Tuffy balanced construction. Mount a reel on your scraper—save wasting sound rope.



Tuffy Slings and Hoist Lines

Slings are a patented, 9-part machine-braided wire fabric that is next to impossible to knot or kink. Hoist lines have built-in strength, toughness, flexibility. Balanced—a top-performing team for handling every type of material. In addition to Tuffy, Union Wire Rope furnishes a complete line of slings.



Tuffy Dozer Rope

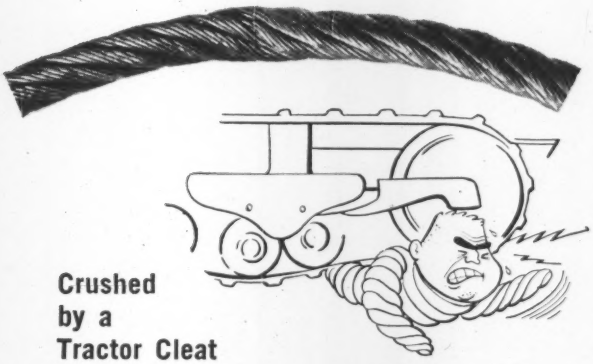
Mounts right on your dozer in a 150′ reel. When rope shows wear, just feed through enough to replace the damaged part. Saves rope, gives you a bonus of extra service. Also available in 300′ and 500′ reels.

Union's Field Organization Will Help Select the exact rope you need from the Tuffy family of wire rope and slings tailored to special needs and from more than 1600 standard constructions. All have the balanced strength, toughness and flexibility that add up to long, trouble-free service. If your rope need is new, even more specialized, you are invited to bring your case to our research laboratory. That's the way many of today's special purpose constructions were developed. No obligation. Call your Union Distributor—listed in phone book Yellow Pages.

Tuffy® Tips

New steels are born at Armco

of service life when properly used . . . not abused . . .



Crushed by a Tractor Cleat

The Sunday punch for this piece of wire rope was delivered by a tractor cleat—just one of many crushing injuries caused by rope being run over or banged into by hard, sharp objects. Even the toughest wire rope is no match for this kind of mistreatment.

After a Suicide Jump

This rope jumped out of sheave and was soon destroyed by pulling around the shaft. Actually, it was a case of sudden slack which threw the rope out of the sheave.

Tuffy Dragline Rope

High abrasive resistance and super flexibility. Gives long service, dependable action in handling any material—wet or dry dirt, sand, gravel, rock, minerals. Rides smoothly on grooves—hugs the drum when casting for full load.

Union Wire Rope Handbook of TUFFY TIPS . . . Free!

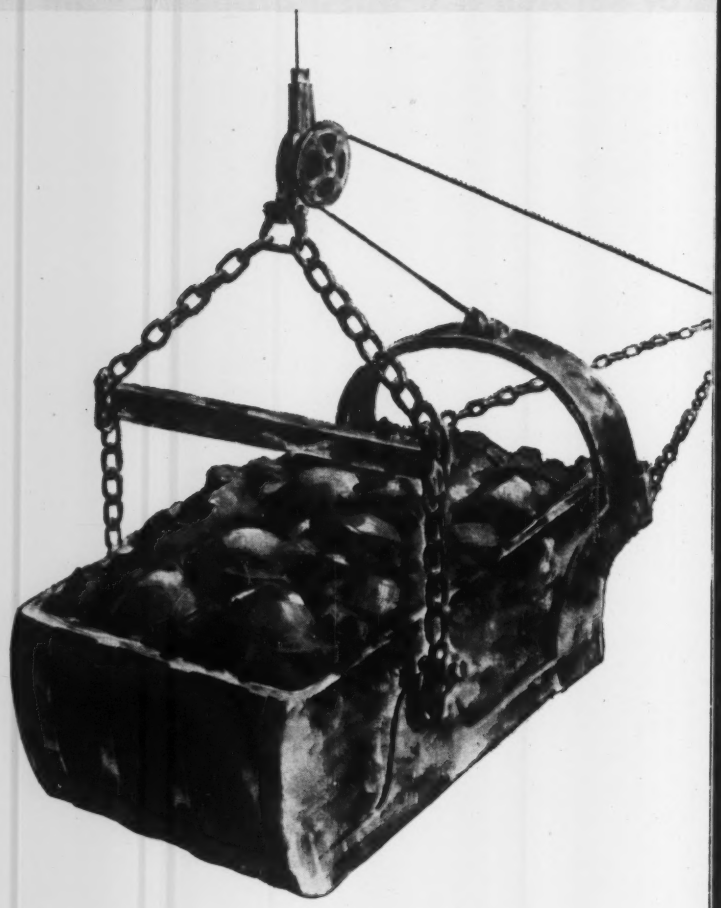
The "Tuffy Tips" shown here are quoted right out of Union's handbook. In it there are dozens of other priceless hints on the correct use of wire rope. The common abuses and how to avoid them. How to save costly injuries. Maintenance tips. The proper fittings and how to apply them. Recommended sizes. Many other facts and suggestions that will cut down your rope costs and help you get out of wire rope the full service we build into it. No charge. Write Union Wire Rope, Armco Steel Corporation, 2228 Manchester Ave., Kansas City 26, Missouri.

1-61

ARMCO Union Wire Rope

engine power
BY CATERPILLAR

How 33,000 psi cuts costs per ton



The heart of a dragline or excavator is its power source

Take the case of the Cat D397, used in the majority of large diesel powered machines. It has a horsepower rating of up to 730. Its 33,000 psi tensile strength block is precision built to provide a strong, rigid framework for all engine parts.

Here are just a few of the other features that make the D397 your best buy for excavator power. Turbocharging gives higher horsepower per pound of engine. Oil is 100% filtered to lengthen overhaul periods and engine life. Non-clogging, single-orifice injection valves let you use low-grade, low-cost fuels with cetane ratings as low as 35. These fuels have more BTU's per pound; they provide more energy per gallon.

Bearings are steel-backed aluminum alloy for high load-carrying capacity and resistance to corrosion and wear. Cat piston assemblies combine light weight in aluminum pistons, high wear resistance in chrome rings and the durability of cast iron in the top ring band. Heat treated, wet liners are full length to give rapid heat transfer, longer ring, liner and lube oil life.

If you could look inside the Cat D397 Engine you'd see additional evidence of quality in the high-strength crankshaft, in precision-ground camshaft, in the efficient cylinder heads and valve train.

Your Caterpillar Dealer is the man to see for complete facts. He'll tell you how you can save more money and make more money with Caterpillar powered excavators. Get in touch with him. It may be one of the most profitable talks you've ever had.

The D397's cylinder block is cast in Caterpillar's own foundry. Careful control, modern processing and rigid inspection all along the line insure a rugged foundation for all engine parts.

CATERPILLAR

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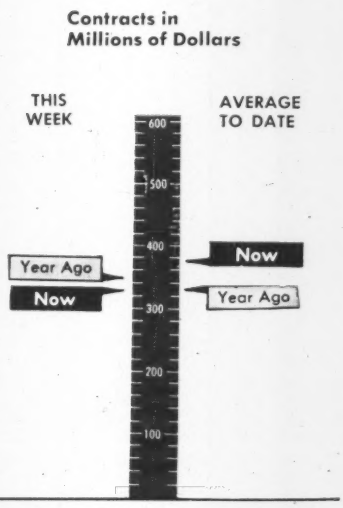
Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.

Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

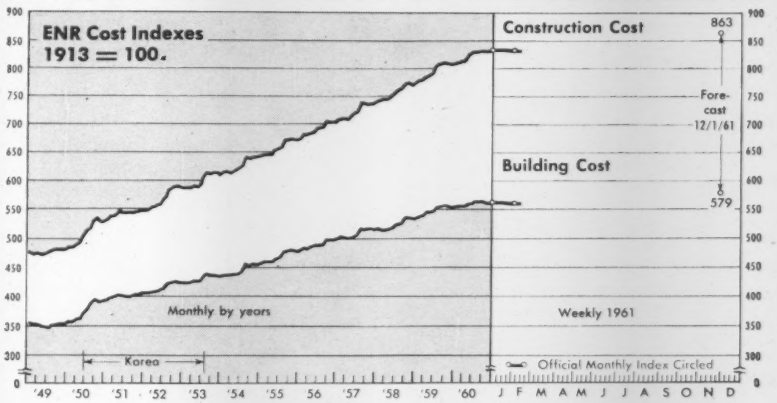
Contracts Awarded In 50 States By Type	This Week	Cum. 7 wks 1961	Chge '60-'61
	millions		%
All Heavy Construction	$329.1	$2,623.0	+11
By Ownership			
PRIVATE	197.5	1,306.4	+5
PUBLIC	131.6	1,316.6	+18
State & Municipal	106.1	1,019.9	+22
Federal	25.5	296.7	+6
By Type of Work			
PUBLIC			
Waterworks	12.7	45.8	+29
Sewerage	11.3	77.4	−6
Bridges*	9.9	71.5	−19
Highways	19.1	481.6	+49
Earthwork, Dams & Waterways	10.0	74.2	−23
Buildings:			
Excl. Housing	30.7	347.0	+53
Housing	21.0	74.6	−8
Unclassified	16.9	144.5	−20
PRIVATE			
Buildings:			
Mass Housing	92.1	497.9	−10
Commercial	42.0	280.2	+8
Industrial	59.1	462.4	+28
Unclassified	4.3	65.9	−7

* Includes Private bridges

NOTE Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Feb. 9	Cum. 6 wks 1961	Chge '60-'61
	millions		%
Corporate Securities	$23.0	$179.0	−12
State and Municipal:			
All Except Housing	190.1	739.7	−18
Housing	0.1	1.6	+167
Federal Loans	1.6	30.3	+422
Federal Aid	0	0	0
Total Nonfederal	$214.8	$950.6	−14
Federal Appropriations:			
Projects in U.S.	0	0	0
Outside U.S.	0	0	0
Total New Capital	$214.8	$950.6	−14


ENR Cost Indexes 1913 = 100.
Construction Cost
863
Fore-cast 12/1/61
Building Cost
579
Monthly by years
Weekly 1961
Korea
Official Monthly Index Circled
'49 '50 '51 '52 '53 '54 '55 56 '57 '58 '59 '60 J F M A M J J A S O N D

ENR INDEXES (1913=100), 20-cities' average	Week of Feb. 9 1961	% Change from Jan. 12 1961	% Change from Feb. 4 1960
Construction Cost	834.05	−0.06	+2.6
Building Cost	562.71	−0.07	+1.3

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1919 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

Latest Month . . .

CONTRACTS AWARDED

	1961 Jan. (millions)	Percent Change from 1960 Dec.[a]	Jan.
Total U. S. (ENR reported)	$1,661	+11	+31
Private	785	+26	+17
Public	876	− 0.2	+47
State and Municipal	641	− 0.02	+53
Federal	235	− 1	+33
ENR Volume Index, 1913=100	557	+11	+29

NEW CONSTRUCTION CAPITAL

Total U. S.	625	−23	−29
State and Municipal Bond Sales	450	−20	−40
Corporate Security Sales	149	−38	+17
Federal Loans, Aid (nonfederal work)	26	+475	+665
Federal Appropriations,* (federal work)	0	0	0

* Includes funds for outside U. S.
a Based on average week: 4 weeks in Jan., '61; 5 weeks in Dec. '60.

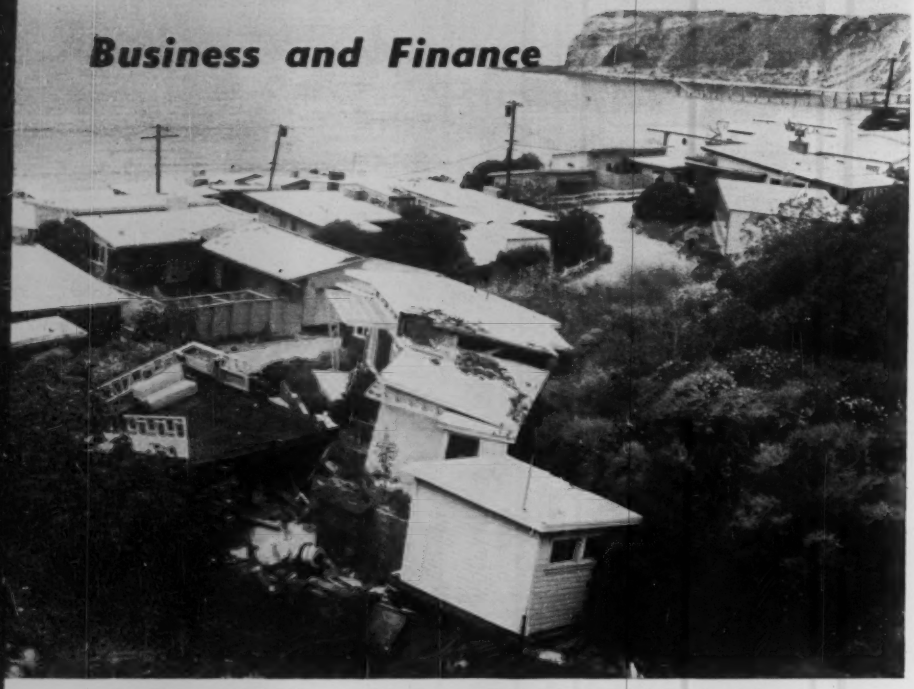
MATERIALS SHIPMENTS

Unit	1960 Nov. (N) Dec. (D)	Cum. (No. of Mos.)	Percent Change from Year Ago Mo.	Cum.
Portland Cement, Bur Mines, thous bbls	14,977(D)	312,079(12)	−26	− 7
Concrete Paving Awards, PCA, thous sq yd	11,582(D)	117,760(12)	+73	+26
Fabricated Structural Steel, thous tons	246(D)	3,436(12)	+ 4	+18
Bookings, AISC, thous tons	222(D)	3,210(12)	−39	−0.4
Reinforcing Bars, Net, AISI, thous tons	148(D)	2,214(12)	−30	+ 2
Lumber, NLMA, mil fbm	2,331(D)	33,834(12)	−17	− 6
Orders, mil fbm	2,344(D)	33,197(12)	−23	− 8
Production, mil fbm	2,250(D)	34,753(12)	−24	− 5
Clay Products, Bureau of Census				
Brick, Unglazed, Common, Face, mil bri	537(N)	6,133(11)	− 1	−10
Vitrified Clay Sewer Pipe, thous tons	143(N)	1,750(11)	− 2	− 5
Structural Tile, Unglazed, thous tons	41(N)	463(11)	+17	− 5
Asphalt Products, Bureau of Census				
Asphalt Roofing, thous sales sqs	4,537(N)	54,963(11)	+20	− 3
Asphalt Siding, thous sales sqs	84(N)	797(11)	+11	−10
Aluminum, Wrought, Net, Bur Census				
Sheet and Plate (non-heat treatable), mil lbs	92(N)	1,125(11)	− 1	− 4
Wire and Cable, mil lbs	21(N)	273(11)	+ 4	− 8
Extruded Shapes (soft alloys), mil lbs	66(N)	755(11)	−11	− 9

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS, thous	2,530(D)	2,770(12)**	− 6	+ 2
Contractor Failures, Dun & Bradstreet				
Number	245(D)	2,607(12)	+50	+26
Liabilities, thous	$28,104(D)	$201,369(12)	+169	+65

**Average per month



BROKEN HOMES have shifted seaward in Los Angeles' big land-slip.

WRECKAGE is not all that's left behind . . .

Financial-Legal Troubles Follow

A Los Angeles judge is trying to decide who and what is responsible for five years of creeping earth that has shattered a 200-acre suburban development. On his decision will rest the fate of 175 court suits claiming total damages of more than $19 million.

The suits seek redress for 156 damaged houses and a battered country club in Portuguese Bend, a development on the Palo Verdes Peninsula about 25 miles south of Los Angeles.

The land under Portuguese Bend has been slipping toward the Pacific at the rate of about an inch a day since the summer of 1956.

Involved in the tangle of suits and cross-suits are the developer, Palos Verdes Properties, Inc.; Palos Verdes Water Co.; Los Angeles County and several insurance companies.

Homeowners have filed some 130 lawsuits asking a total of $7.5 million in damages from the county and another $7.5 million from the developer, Palos Verdes Properties.

The developing company has also entered a $3.5-million suit against the county, while the county has filed a cross-suit against the developer and Palos Verdes Water Co. The county is seeking $1 million for damages to two streets, Palos Verdes Drive South and Crenshaw Blvd. Smaller suits have been entered against the county and the developer for damages to water lines and mains.

In addition, 40 suits have been initiated against the county by insurance companies seeking to recover losses resulting from payments on homeowners' claims.

Actions against the county charge that the slide was triggered by construction of an extension to Crenshaw Blvd., which would have provided a direct route from downtown Los Angeles to the peninsula.

The road project, a cut and fill operation, was halted when slippage developed. The extension was subsequently closed—and now the completed section of road is a twisted victim of the big creep.

Actions against the developer and the water company claim they had engineering and geological knowledge of the unstable character of the land before they started construction in the tract.

Slippage was first noted in July 1956. First warnings to the owners of the $15,000 to $50,000 houses were dramatic—windows cracked, walls and floors buckled, patios warped and ruptured, foundations sagged, walls split open and roofs leaked.

By November, $5 million worth of damage suits had been filed (ENR Nov. 29, 1956, p. 27). But that was only a start, as the damage potential was still to be fully realized. There may be more suits still to come.

The county tried to stem the slide in 1957. It sunk 15 concrete and steel caissons into the ground at the foot of the moving earth-mass (ENR Sept. 19, 1957, p. 26). Each weighed 22 tons, was 20 ft long and 4 ft in diameter. Another 10 caissons of similar size were sunk into stable earth by the development company.

It was thought at the time that the earth might move another 6 to 8 in. then stop. But the caissons were ineffective. The earth flowed around them; they were eventually crushed by the moving mass.

The county considered moving earth from the top of the slide area and constructing at its bottom a rock revetment backed by earth fill. The cost was estimated at $2.2 million. But engineers could not guarantee the plan would halt the slide; the idea was abandoned.

By 1958, after earth had slipped at a rate of about 1¼ in. every 24 hours, Los Angeles County officials ordered the evacuation of 47 houses and condemned the clubhouse, which by then had lost its swimming pool. This feature was destroyed once, then rebuilt. Today the waters of the Pacific Ocean wash over the reconstructed pool and the clubhouse is boarded up.

Of the 156 houses in the tract, only 20 are occupied, although these too are damaged. Most of the houses had to be abandoned when sanitary and drainage systems failed.

Slippage toward the sea has slowed, amounting now to one-quarter to three-eighths of an inch every 24 hours. From July 1956 until now maximum horizontal movement is estimated from three locations: upper hilly end of the

. . . There's also $19 million in damage suits.

Land Slip

slide area, an estimated 71 ft during 1,518 days; an area below the up side, close to the ocean, 87 ft in 1,489 days; another area near the ocean, 100 ft. (No days figure is available, but the number is about the same as the other two.)

Test bores show the depth of the slide varies in the area, but at the deepest point it extends 150 ft below the surface.

The area has been described as landslide region on geologic maps since the early 1920s. In 1946, a Department of Interior geological paper said probable cause of slippage tendencies in the region is bentonitic tuff. When sufficiently water-impregnated, this material serves as a lubricant for rock masses overlying it, the paper says.

Testimony of geologists is expected to play an important part in the court cases. These men may help answer the basic questions: Was the slide due to natural causes similar to those that started slides in the peninsula in the past? Was the slide initiated by the road work? Could introduction of water to the subsurface by irrigation or septic tanks have triggered the latest earth movement?

Meanwhile, the community of crushed houses, broken roads and leaning utility poles stands as a scarecrow to potential customers for other developments on the peninsula. Although the new housing developments apparently are on stable ground, buyers aren't taking any chances.

Law Book Hits Electrical Firms

Still staggering under the impact of $1.8 million in fines levied last week by a federal district court, 29 electrical equipment manufacturers that violated the Sherman Antitrust Act are braced for a flood of damage suits.

In addition to the fines levied on the corporations, 44 of the companies' executives were fined a total of $137,500, seven of them were sentenced to 30-day jail terms, and 23 others received suspended 30-day jail sentences and were placed on probation for five years.

Companies pleading guilty or no defense to the price-fixing charges were among the largest in the country and included General Electric Co., Westinghouse Electric Corp., and Allis-Chalmers Manufacturing Co.

An estimate of the dollar volume of anticipated claims is almost impossible at this time, but there is little doubt the total will run to several million dollars. The indictments covered the four-year period from 1956 to 1959, inclusive. Sales of the products involved totaled about $7 billion.

Under the law, federal agencies can sue only for the actual amount of overcharges that can be proved. All other levels of government and private corporations may sue for triple damages.

The U. S. Justice Department is preparing damage suits on behalf of several agencies, including the Bureau of Reclamation, Corps of Engineers and General Services Administration.

TVA appears to be getting special treatment. There is a chance an attempt will be made to sue for triple damages because TVA is a corporation. Both Attorney General Robert F. Kennedy and Wallace Kirkpatrick, acting head of the Antitrust Division, mentioned the corporate status of TVA.

The first federal complaints may be filed within two months.

The torrent of suits is building rapidly at state, municipal, county and special district levels. A spokesman for the National Institute of Municipal Law Officers in Washington, D. C., says it is planning the consolidation of multimillion dollars worth of suits for 171 cities. Involved are Chicago, Philadelphia, Detroit, Cleveland, Milwaukee, St. Paul, New Orleans, San Francisco, Los Angeles, San Diego, Kansas City and Salt Lake City. New York City is also preparing its own case.

Actions will also be brought by several states—Washington, California, Wisconsin, Minnesota, New Jersey and New York. Action by New York State would involve the Power Authority now constructing the $700-million Niagara Power complex.

In Washington State, Chelan County and Grant County Public Utility Districts will join with the state's attorney general in recovering overcharges on equipment for their projects. Grant County has two dams under way—Priest Rapids and Wanapum.

FTC Shoots at Materials Maker

The Federal Trade Commission is on the warpath again, this time against American-Marietta Co. of Chicago. FTC charges that American-Marietta illegally acquired manufacturing companies, thereby tending to monopolize production and sale of concrete pipe, cement, construction aggregates and lime.

The FTC asks that American-Marietta be ordered to divest itself of 33 concrete pipe makers, four cement companies, six producers of aggregates and one lime company.

American-Marietta has systematically eliminated actual and potential competition by these acquisitions in violation of the Clayton Act, FTC charges. It also claims the series of acquisitions was an unfair method of competition in violation of Section 5 of the Federal Trade Commission Act. (Use of the law in this manner is unusual. It has been used before by FTC, but the full commission has never ruled on it, and it has not been tested in court.)

American-Marietta had acquired 20 companies up to 1950 for about $13 million the FTC says. But since 1950, the concern has acquired more than 70 companies at a cost of over $250 million.

Concentration in the concrete pipe industry has been substantially increased as result of these acquisitions, while American-Marietta has improved its own competitive position and made entry into the industry more difficult, the FTC charges.

Robert E. Pflaumer, president of the company, denies that American-Marietta's acquisitions were illegal. "None of American-Marietta's acquisitions has had the effect of substantially lessening competition or creating a monopoly in any part of the country and we are prepared to prove it," he said.

Last month, the company reported net income for the fiscal year ended November 30 would top $24 million, compared to $22.8 million in 1959. Sales for the 1960 period totaled $368 million, as against $323.6 million in Fiscal 1959.

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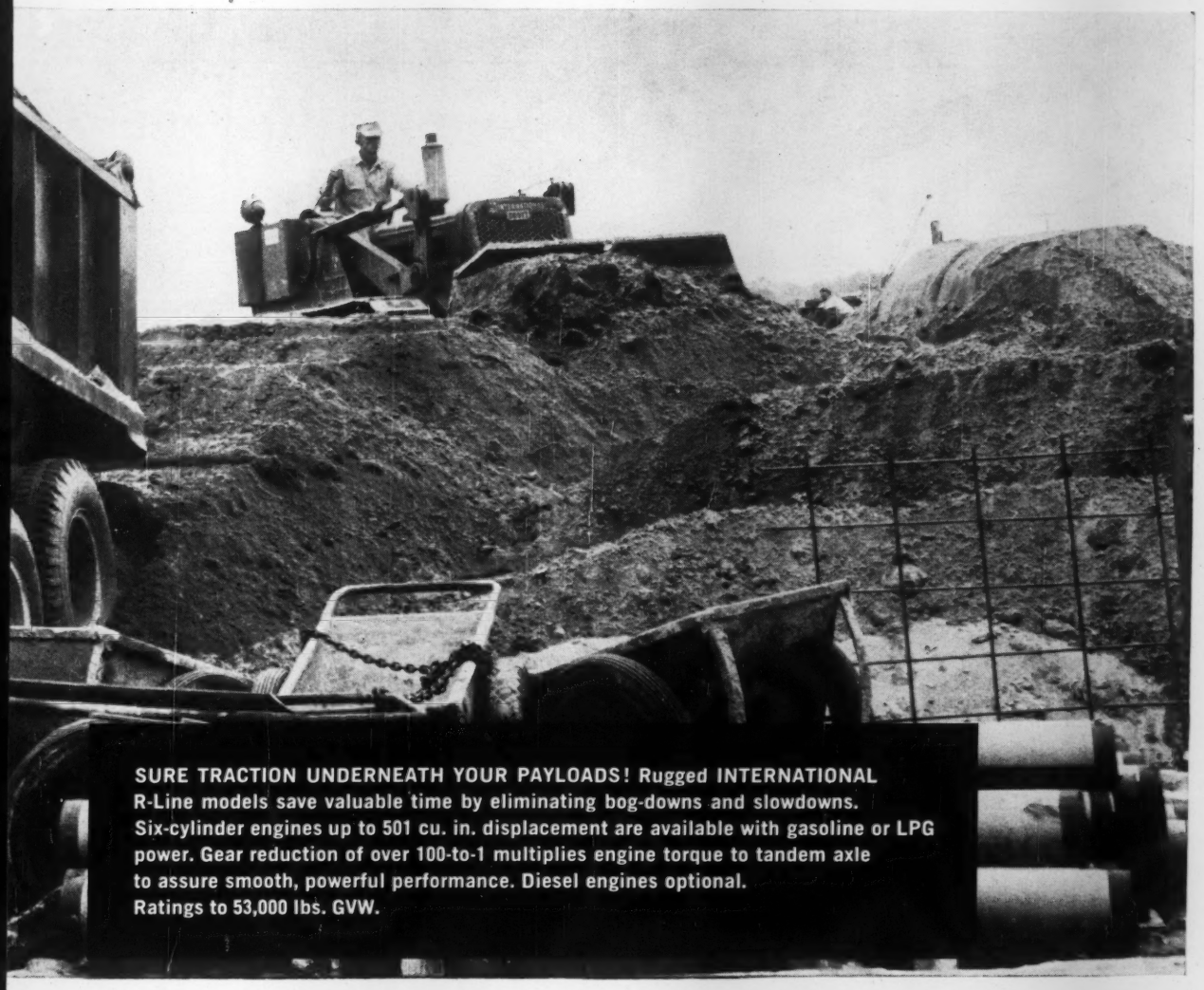

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Two-lever, "Joy-Stick" air power controls blend operations for faster, smoother cycles.

"Shear-Ball" connection for "rock steady," smooth swing. No adjustment, maintenance or lubrication problems. Covered by a 10-year warranty.

Three power shafts for simultaneous hoist, swing and travel. Give maximum flexibility.

Air-ease, crawler controls. Air power does the work. Two travel speeds in both directions.

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Wage Bill Touches Construction Labor

Minimum wage and overtime pay protection would go to 800,000 more construction workers

Regular pay and overtime rates in the construction industry are generally considered good—but not good enough to escape the effect of the changes proposed in the Fair Labor Standards Act, which now calls for a 40-hour week and a $1.00 minimum wage.

The changes contained in the Administration's minimum wage bill would sweep another 800,000 construction workers under the law's umbrella. Most of these workers are now getting at least $1.00 an hour and would benefit primarily from the law's overtime protection—time-and-a-half for hours over 40 a week.

The bill was introduced in the House last week by Rep. James Roosevelt (D., Calif.). It would gradually raise the minimum wage to $1.25 an hour and extend the law's coverage, to an additional 4.3 million workers, the large majority of whom are in the retail and service trades.

Rep. Adam Clayton Powell (D., N. Y.), chairman of the House Labor Committee, said he would begin hearings on the bill on February 17.

Extended coverage for the construction industry would be achieved by a new sales-volume formula. Under the bill, the FLSA would apply to any "establishment engaged in the business of construction or reconstruction" if the company does business in interstate commerce and if its "annual gross volume of sales" is $350,000 or more. And contrary to present law, all employees of a company would be entitled to the law's protection if any one of them is covered.

One of the results may be to increase the confusion over who is covered and who is not. The question, at least in the construction industry, has always been a sticky one. Despite such well known cases as the Vollmer and Lublin, McGaughy ones, the U.S. Supreme Court has done little more than assure contractors and engineers that doubts about coverage will seldom be resolved in favor of employers.

Under the Roosevelt bill's basic provisions:

- The minimum wage for workers now covered would be raised in three steps—from $1.00 to $1.15 this year, to $1.20 next year and to $1.25 in 1963.
- The minimum wage for workers now brought under the law for the first time would go up to $1.25 in four steps—$1.00 this year, $1.05 next year, $1.15 in 1963 and $1.25 in 1964.
- Newly covered workers would not immediately get the law's overtime protection. They would receive no protection the first year. They would get overtime for hours over 44 a week the second year, for hours over 42 the third year and for hours over 40 afterwards.

Considerable confusion appeared to exist last week over the probable effect of additional coverage for the construction industry.

U.S. Labor Department spokesmen conceded that most construction workers are already paid over the minimum wage and that the bulk of the 800,000 workers who would be newly covered would benefit only from the overtime protection. But they did say that the 800,000 figure includes 40,000 workers who now earn less than $1.00 an hour in construction, and 59,000 workers who are now earning less than $1.25 an hour.

The government's latest monthly earnings report put average hourly earnings of construction workers at $3.32, including overtime, for an average workweek of 35.3 hours. Government statistics do show, however, that some collective bargaining agreements for building laborers call for minimum wages as low as $1.20 an hour (see p. 118).

Labor union officials, including AFL-CIO President George Meany, have indicated that the impact of extended coverage in construction would be limited almost exclusively to the overtime pay practices of nonunion employers.

Labor in Brief . . .

- **Three-year contract**—A new 35-cent, three-year labor contract that eliminates transportation allowances has been negotiated by the Portland Chapter of Associated General Contractors and the Oregon and Western Washington Councils of Laborers. Increase is payable in three installments—15 cents this year and 10 cents each of the last two years.

- **Broader jurisdiction**—The Executive Board of the International Brotherhood of Teamsters, meeting in Miami last week, laid the groundwork for a constitutional amendment asserting teamster jurisdictional claims over all unorganized workers in all industries. The change would give the teamsters a stronger hand in jurisdictional disputes.

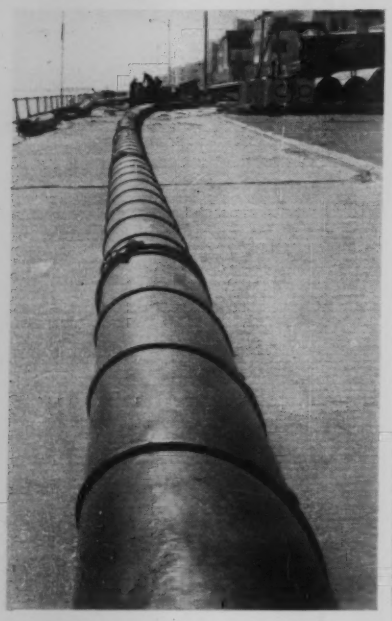
- **Employment down**—Construction employment dropped by 184,000 and fell to 2,362,000 last month. This is 91,000 below the level a year ago. Although Labor Department officials called the drop "predominantly seasonal," it was part of an over-all climb in unemployment to 5.4 million—the worst January joblessness situation since before World War II.

- **Compulsory arbitration** – Teamster President James Hoffa has asked the American Trucking Association to withdraw endorsement of a Wisconsin truckers' call for federal legislation requiring compulsory arbitration of labor disputes in the industry, including bargaining disputes over wages.

- **Picketing curbs** – Federal legislation to localize strikes by confining picketing to the geographical area of a dispute and to the immediate parties involved is being urged by the New York Chamber of Commerce. Request is an outgrowth of the harbor strike last month (ENR Feb. 2, p. 115).

- **The penalty of bumping**—An out-of-town union electrical worker who is unemployed because he was "bumped off" a job by an unemployed member of the local union is voluntarily unemployed and not entitled to unemployment compensation in Delaware, according to a Delaware judge. The court found the bumping was the result of a voluntary "gentlemen's agreement" among union members.

SHORT CUT TO LONG LINES



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Union Pay Scales Average $3.70

Union wages in the construction industry have climbed a little more than 4% a year during each of the last five years.

On January 3, the average wage rate for all union building tradesmen has reached a record high of $3.70, according to estimates of the U. S. Labor Department's Bureau of Labor Statistics.

In a quarterly wage report released this month, the bureau said that wage increases granted under collective bargaining agreements with selected trades last year averaged 14.8 cents an hour. This represents an increase of 4.2% over the year and makes the January 1961 level of rates 79% higher than the average for the years 1947-49.

The 1960 figures are based on a bureau survey of seven trades in 100 cities (see Table I). They do not include fringe benefit contributions.

The bureau's report does not mean, however, that the average construction worker is earning $3.70 an hour, or $129.50 for a 35-hour week.

Other bureau reports that use a much broader base, including nonunion workers, show that average hourly earnings in the industry are much lower. According to the latest report of that kind, for example, average hourly earnings in the construction industry were $3.32 last November. The average workweek was then 35.3 hours, yielding average weekly earnings of $117.20, exclusive of overtime pay.

In checking the changes that occurred in union wage scales last year, the bureau found that the average hourly increases for the seven trades ranged from 9.9 cents for plasterers to 19 cents for electrical workers. This is a wider range than occurred in 1959 and is about the same as the 1957 range.

Looking back over the last six years, the last time annual wage increases were held to an average as low as 10 cents an hour was in 1955. The average of the annual increases since then has ranged from 14 to 15.6 cents an hour (see Table II). Last year's average of 14.8 cents, however, was lower than either of the 1957 or 1959 averages.

I—The Shape of 1960 Wage Boosts

Trade	Average for 1960 Percent	Average for 1960 Cents	Rate Levels January 3, 1961 Average	Rate Levels January 3, 1961 Range
Bricklayers	3.5	14.2	$4.22	$2.90-$5.00
Carpenters	4.3	15.8	3.82	2.33- 4.65
Electrical workers	4.9	19.0	4.08	2.85- 4.65
Painters	3.9	13.1	3.58	1.75- 3.95
Plasterers	2.5	9.9	4.09	2.75- 4.70
Plumbers	3.3	12.8	4.04	3.00- 4.45
Laborers (building)	4.9	13.2	2.83	1.20- 3.90
All trades	4.2	14.8	3.70	-

II—Wage Changes in Last Six Years

(Estimated averages for union construction workers*)

Year	Hourly Increase Over the Year	Range of Increase for Individual Trades	Wage Scale at End of Year
1955	10 ¢ or 3.5%	8 to 11 ¢	$2.94
1956	14 ¢ or 4.7%	11 to 18 ¢	3.08
1957	15 ¢ or 4.9%	10 to 19 ¢	3.23
1958	14.5¢ or 4.5%	10 to 18 ¢	3.38
1959	15.6¢ or 4.7%	14.8 to 18.2¢	3.54
1960	14.8¢ or 4.2%	9.9 to 19 ¢	3.70

*Based on Bureau of Labor Statistics' surveys of seven major building trades in 100 cities. Figures reflect minimum rates established by collective bargaining and do not include fringe benefits.

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Rock and Tunnel Workers Lose Bid for Bargaining

The National Labor Relations Board in San Francisco has turned down a request by the recently organized Rock and Tunnel Workers of America that it be allowed to seek representation rights as a bona fide bargaining group.

In doing so, the regional director, Gerald Brown, has allayed the fears of northern California contractors that the construction industry would be hit by a new series of jurisdictional strikes.

The Rock and Tunnel Workers, whose jurisdictional interests conflict with those of the laborers union, claims members in several western states. All of the tunnel workers it seeks to represent in northern California, for example, are now reportedly covered by master contracts with the laborers union. The new group struck northern California construction projects early in January in an effort to gain recognition.

The NLRB regional director rejected the recognition request on the grounds that the new union was unable to show that it represents a basic craft or that its members represent an identifiable, homogeneous working group.

R. L. Andreoff, president of the union, contended that only a union organized specifically for tunnel men can represent their interests adequately. Pointing to "unsafe working conditions" that now exist, he said that specific grievances include the fact that laborers untrained for tunnel work are sent in with tunnel workers, creating "extremely dangerous" conditions.

Mr. Andreoff said he would appeal the regional director's decision.

Former Chicago Lawyer Named NLRB Chairman

Frank W. McCulloch of Evanston, Ill., has been named chairman of the National Labor Relations Board. He will take over the chairmanship from Boyd Leedom, who will remain as a board member during the unexpired term of his present appointment.

Mr. McCulloch, now 55, has served as administrative assistant to Sen. Paul H. Douglas (D., Ill.) for the last 11 years.

He will fill the vacancy being left on the board by Arthur Kimball, who had been given a recess appointment by President Eisenhower.

A graduate of Williams College and Harvard Law School, Mr. McCulloch was a practicing attorney in Chicago before his Washington association with Senator Douglas.

OFFICIAL PROPOSALS

Bids: March 20, 1961

Construction of Sewage Works

CITY OF BEACON
NEW YORK

Sealed proposals for construction of Sewage Works will be received by the City Council at the City Office, 453 Main Street, Beacon, New York, until 8:00 P.M. Eastern Standard Time on March 20th, 1961, after which time they will be publicly opened and read aloud. No bids will be accepted after said hour. Proposals will be received on the following contracts:

Sewage Treatment Plant.....Contract 3
South and Main Street
Intercepting Sewer..Contract 5
North Intercepting Sewer, Force
Main and Land Outfall
Sewer .....Contract 6
Subaqueous Outfall Sewer....Contract 7

Information for Bidders, Proposal forms, Specimen Contract, Plans, Specifications and copies or specimens of all pertinent documents may be examined at the offices of Bowe, Albertson & Associates, Engineers, 75 West Street, New York, New York and at the City Office, 453 Main Street, Beacon, New York, between the hours of 10:00 A.M. and 4:00 P.M. daily except Saturdays, Sundays and holidays.

Copies of the plans and specifications may be obtained at the City Office and at the offices of the Engineers, upon making a deposit of Twenty-Five ($25.00) dollars, which will be refunded to bidders only who apply for a refund within thirty (30) days after the date proposals are opened and who return the plans in good condition.

Extra copies of plans and specifications may be obtained at a cost of Ten ($10.00) dollars each, which will not be refunded. Extra sheets of plans may be obtained at a cost of One ($1.00) dollar each, which will not be refunded.

A certified check or a cashier's check made payable to the order of the City of Beacon, New York, in the amount of 5% of each bid must be deposited by the bidder with his bid as a guarantee that, in case a Contract is awarded to him, he will execute such contract and furnish a satisfactory Performance Bond and Labor and Material Bond. Acceptance of the bid will be contingent upon fulfillment of this requirement by the bidder and on failure to do so, he shall forfeit the deposit.

The City Council of the City of Beacon reserves the right to reject any or all bids, to waive any informalities or to accept the bid or bids which in its judgment will be for the best interests of the City of Beacon.

CITY OF BEACON,
NEW YORK
By George Mordas
City Clerk

BOWE, ALBERTSON & ASSOCIATES
Engineers

Bids: March 2, 1961

New York State Department of Public Works

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and Canal Law, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 2nd day of March 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name
DISTRICT No. 1, N. F. Ronan, Acting District Engineer, 333 Broadway, Albany, New York		
Greene	R.C. 61-37	Lexington-Prattsville, Pt. 2, S.H. 886, Bridge No. 1
DISTRICT No. 10, Austin M. Sarr, District Engineer, 325 W. Main Street, Babylon, Long Island, New York		
Queens	B.P. 61-84	Far Rockaway, The Rockaways, City of New York

	Type	Deposit	Estimated Cost of Work
Bridge Repairs		$5,000 Plans $5	$87,000
Beach Protection 3 Stone Groins and Bulkheading		$14,000 Plans $0	$250,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: March 2, 1961

New Jersey Turnpike Authority

CONTRACT NOS. R-87A, R-87B, R-87C, R-87D, R-87E AND R-87F

Proposals are invited for Contract Nos. R-87A, R-87B, R-87C, R-87D, R-87E and R-87F which involves the construction of an addition and alterations to the present Service Building of the New Jersey Turnpike Authority, at Service Area 4N in Mt. Laurel Township, Burlington County, New Jersey as follows:

Contract No. R-87A—General Construction
Contract No. R-87B—Structural Steel
Contract No. R-87C—Heating, Ventilating and Refrigeration
Contract No. R-87D—Plumbing
Contract No. R-87E—Electrical
Contract No. R-87F—Kitchen Equipment

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 o'clock, Eastern Standard Time, on the morning of March 2, 1961, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement on the form furnished by the Authority.

Contract documents may be examined during office hours on or after February 9, 1961, at the office of the Authority, and will be furnished upon payment of Ten Dollars ($10.00) for each set, not refundable.

NEW JERSEY TURNPIKE AUTHORITY
Joseph Morecraft, Jr., Chairman

February 2, 1961
R-87 A-1

OFFICIAL PROPOSALS

Bids: February 23, 1961.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and Canal Law and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 23rd day of February 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Madison	M 61-1	Village of Canastota: Peterboro St.-West Old Erie Canal	0.04	Enclosing A Portion of The Old Erie Canal	$4,000 Plans $5	$71,000
Montgomery	US 107	Village of Fort Plain: Lock 15E—Erie Canal	....	Replacing Lock Gates and Sills	5% of Bid Plans $10	Confidential
Oneida (Rte. 69)	FARC 61-14	Camden Taberg, Pt. 2, S.H. 5139; Thomson Corners-Taberg, S.H. 1158; Rome-Taberg, S.H. 563 Project F-635(6), S-597(1) and U-635(6)	6.41	Cem. Conc. Pavt. = 6.01 Mi.; Asph. Conc. Ty. 1 = 0.40 Mi.; Prestressed Conc. Beam Bridge 5 Sps., 343.9′ Tot.	$120,000 Plans $5	2,190,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe	M 61-4	City of Rochester: Sector Gate 2 Court St. Dam on Genesee River	....	Cleaning & Painting Sector Gate 2	$400 Plans $5	7,600
Monroe (Int. Trg. Rte. 490)	FISH 61-6 FASH 6[illegible]7	Interstate Rte. Connection 580 Rochester Western Expressway (Buffalo Road to Howard Road) Elm Grove Rd. Connection Project I-IG-490-2(21); U-783(6)	3.08 (5.04 Acc.)	9″ Cem. Conc. Pavt. 2 @ 24′ = 2.88 Mi.; Asph. Conc. Ty. 1A = 0.04 Mi.; Misc. Work = 0.16 Mi.; Access = 4.15 Mi., Cem. Conc. Pavt.; 0.86 Mi. Asph. Conc. Pavt. Type 1A; 0.03 Mi. Misc. Work; 8 H.G.S. Comp. I-Beam; 4 Sps. 186.8′ Tot.; 4 Sps. 186.8′ Tot.; 3 Sps. 179′ Tot.; 3 Sps. 171′ Tot.; 3 Sps. 195.8′ Tot.; 3 Sps. 133.5′ Tot.; 3 Sps. 159.7′ Tot.; 3 Sps. 202.3′ Tot.	$240,000 Plans $10	4,375,000
Monroe & Orleans	M 61-2	City of Rochester: West Guard Lock Bridge E-186, Orrs, Over Erie Barge Caal	....	Cleaning & Paint. Structural Steel on West Guard Lock; Cleaning & Painting Bridge	$500 Plans $5	9,300
DISTRICT No. 6, WM. J. DENNIS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Steuben (Rte. 15 & 371)	FARC 61-1	Cohocton-Wayland, Pt. 1 S.H. 1104; Avoca-Wallace-Cohocton, S.H. 5564; Cohocton-Naples, Pt. 1, S.H. 5611 Project F-627(12); S-523(1)	1.52	8″ Cem. Conc. Pavt. 24′ = 1.32 Mi. Asph. Conc. = 0.17 Mi. Misc. Work = 0.03 Mi.	$35,000 Plans $5	653,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
Clinton (Int. Trg. Rte. 87)	FISH 61-5	Interstate Route 502 Sections 7A3, 7A4, 7A5 (Route 22 to Salmon River Rd.) Project I-IG-87-4(11)	9.08 (3.44 Acc.)	Asph. Conc. Ty. 1A = 8.96 Mi.; Asph. Conc. Type 1A (Access) = 3.44 Mi. Misc. Work = 0.12 Mi.; H.G.S.S. Twin 3 Span Prestressed Conc. Br.: 2 Sps. @ 42.7′; 2 Sps. @ 41.6′; 2 Sps. @ 39.2′ H.G.S.S. Twin; 3 Sps. Prestressed Conc. Br.: 2 Sps. @ 41.2′; 2 Sps. @ 42.4′; 2 Sps. @ 42.3′; Twin 2 Span Comp. WF Beam Br. 4 Sps. @ 57′; Prestressed Conc. Br. 5 Sps. 254.7′ Tot.; R.R.G.S. Twin 3 Span Comp. WF Br. 6 Sps. @ 82.1′; Prestressed Conc. Br.5 Sps. 295.4′ Tot.	$390,000 Plans $10	6,679,000
Clinton	S.H. 61-4	Twin Bridges Road (Interstate Route 87 to US Route 9)	0.52	Asph. Concrete Type 1A	$9,000 Plans $5	163,000
Jefferson (Int. Trg. Rte. 81)	FITS 61-7	Interstate Rte. 505 (Section 7AB-1) (Pierrepont Manor to Oswego County Line) Project I-81-3(21)	4.60 (6.88 Acc.	Traffic Signs	$2,200 Plans $5	40,000
DISTRICT No. 8, K. G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Westchester (Rte. 9)	FARC 61-15	Croton River-Peekskill, S.H. 657, Croton-on-Hudson Village: Riverside Ave., S.H. 1207	2.75 (2.71 Acc.)	9″ Cem. Conc. Pavt. = 2.54 Mi.; Misc. Work = 0.21 Mi.; Access = 2.26 Mi. Cem. Conc. Pavement and 0.45 Mi. Bit. Double Surface Treatment; 2 H.G.S. Comp. Gird. 3 Sps. 184.81′ Tot.; 4 Sps. 238.86′ Tot.; Ped Overpass I-Beam, 4 Sps. 213.92′ Tot.	$265,000 Plans $5	4,852,000
Westchester (Rte. 9)	T.S. 61-2	Broadway-Hastings-Dobbs Ferry-Mt. Pleasant-Tarrytown-No. Tarrytown, S.H. 9206	0.59	Traffic Signs and Delineators	$1,300 Plans $5	24,000
DISTRICT No. 10, A. M. SARR, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Nassau	FAWOBE 61-1	Wantagh-Oyster Bay Expressway, Cont. 2 (Hempstead Turnpike-Old Country Road) Project U-UG-1110(3)	3.29 (3.58 Acc.)	9″ Cem. Conc. Pavt. with Carbon Black = 3.09 Mi.; Misc. Work = 0.20 Mi.; Access = 1.90 Mi. Cem. Conc. Pavt. and 1.68 Mi. Asph. Conc. Pavt.; 5 H.G.S. Comp. W.F. Beam; 2 Sps. 142.2′ Tot.; 2 Sps. 146.5′ Tot.; 2 Sps. 115.2′ Tot.; 1 Sp. 76.3′ Tot.; 1 Sp. 57.8′ Tot.; 2 R.R.G.S. Steel Girder; 2 Sps. 138′ Tot.; 1 Sp. 104′	$330,000 Plans $10	6,001,000
Nassau (Rte. 106)	R.C. 61-11	Jericho-Oyster Bay, S.H. 9021	0.17	Misc. Drainage Work	$7,000 Plans $5	122,000
Nassau & Suffolk	NSP 61-1 SAGSP 61-1 SMSP 61-1	Northern State Parkway Sagtikos State Parkway Sunken Meadow State Parkway	27.26	Roadside Development, Drainage, Misc. Work	$15,000 Plans $5	280,000
Nassau & Suffolk	SSP 61-1	Southern State Parkway	5.82	Landscaping	$7,000 Plans $5	131,000
Suffolk (Rte. 27)	T.S. 61-8	Sunrise Highway Extension FASH 59-13 (S.H. 1883 to Springdale Road	3.98 (5.39 Acc.)	Traffic Signs and Delineators	$1,700 Plans $5	30,000
Suffolk (Rte. 114)	R.C. 61-12	Sag Harbor-Easthampton, S.H. 846	5.29	Asphalt Concrete	$42,000 Plans $5	776,000
Suffolk (Rte. 25A)	R.C. 61-16 FASS 61-1	Smithtown-Port Jefferson, S.H. 5232A, Elimination of Grades of The Long Island R. R. and Nicolls Road (C.R. 97) Project SG-571(1)	1.67	9″ Cem. Conc. Pavt. = 1.10 Mi.; Misc. Work = 0.26 Mi. Cem. Conc. Pavt. with Carb. Black = 0.07 Mi.; Asph. Conc. = 0.24 Incl. R.R.G.S.—Thru Plate Girder; 2 Sps. 127.5′ Tot.	$70,000 Plans $5	1,295,000
Suffolk	FIIB 61-1	Fire Island Inlet Bridge (Captree State Park to Fire Island State Park) Contract No. 1, Substructure	0.87	Bridge Substructure Comprising 2 Abutments and 26 Piers; 4,232.7′ Total	$150,000 Plans $5	2,760,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: April 1961

Kingdom of Thailand
Royal Irrigation Department
Bangkok, Thailand

INVITATION FOR BIDS—NO. YS-2-20
The Royal Irrigation Department of the Kingdom of Thailand hereby invites sealed written bids for furnishing and delivering the following equipment either fob Contractor's shipping point or cif Bangkok Wharf, Thailand, for the Bhumiphol Power Plant, Yanhee Multipurpose Project, Kingdom of Thailand, in accordance with the Contract Documents:

Two (2) Portable oil purifiers with a capacity of 4,550 liters per hour (1,200 gph) of transformer oil or 2,275 liters per hour (600 gph) of turbine and generator lubricating oil.
One (1) Four-wheel, rubber tired trailer suitable for transporting one portable oil purifier.
One (1) Drying oven for filter paper, 2,000 watt rating.

Invitations for Bids will be issued in February, 1961, and will be opened in April, 1961. Copies of Contract Documents, Invitation for Bids—No. YS-2-20, Oil Purification Equipment, may be obtained by qualified Bidders on written request to:

Royal Irrigation Department
Attention: Thai Liaison Engineer
c/o Engineering Consultants, Inc.
1901 South Navajo Street
Denver 23, Colorado

Each request must be accompanied by a check or money order, payable to the Royal Irrigation Department, in the amount of U. S. $5.00 for each copy of the Contract Documents requested. The remittance is nonreturnable.

M. L. Xujati Kambhu
Director General
Royal Irrigation Department
Kingdom of Thailand
Bangkok, Thailand

District of Columbia—Highway Construction—Dept. of Hwys. & Traffic, D. C., Feb. 3, 1961. NO. CAPITOL ST. IMPROVEMENTS GRADE SEPARATION AT NEW YORK AVE. AND INCIDENTAL WORK PIERCE ST. TO "P" ST., FEDERAL AID PROJECT NO. F-7(14), Invitation No. C-611-H, consisting of approx. 16,500 sq. yds. reinf. portland cem. conc. base 10"; 1,820 cu. yds. Class BB concrete for walls; 17,000 cu. ft. Class B stone masonry; and 192,000 lbs. Structural Steel. (Wage rates have been predetermined by the Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Div., Procurement Office, D. C., Room 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $30.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, Mar. 2, 1961, in Rm. 424, 499 Pa. Ave., N.W.

Bids: See advertisement

The Port of New York Authority

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract NYA-410,016—New York International Airport—International Arrival Building—Expansion of Baggage Claim Facilities—Paving and Utilities—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, March 9, 1961.
Contract NYA-140,047—New York International Airport—Van Wyck Expressway—Paving Service Roads—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, March 16, 1961.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, February 16, 1961

Bids: March 15, 1961

Board of Education
Bureau of Construction

Notice Re: Prequalification Forms for Contractors

NOTICE IS HEREBY GIVEN THAT

The Deputy Superintendent of Schools, Office of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, New York will receive applications for prequalifications from contractors who may wish to submit bids for the proposed hereinafter specified contracts.

For the general construction, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures of:

Public School 74,
115th Street and 3rd Avenue,
Borough of Manhattan.
Public School 29,
Courtlandt Avenue, between
East 156th and 157th Streets,
Borough of the Bronx.

The prequalification application form must be secured at the Office of School Buildings, Bureau of Construction, Room 407, 42-15 Crescent Street, Long Island City 1, New York and submitted to the Deputy Superintendent of Schools at the same above address.

Bids when advertised will be received only from prequalified bidders.

The time for submitting prequalification applications by contractors will expire on Wednesday, March 15, 1961.

Joseph R. Weiss
Deputy Superintendent of Schools

Starting: Friday, February 10, 1961
Five (5) days.

Dated: February 8, 1961
JJF:dem

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5502) will be received at East Wenatchee, Washington, until 10 a.m., Pacific Standard Time, March 14, 1961, for furnishing labor and materials for East Unit Electrical Distribution and Control Lines, East Unit, Washington, Chief Joseph Dam Project. Location near Wenatchee, Washington, in Douglas County. Principal items are Furnishing materials and constructing approximately 10 miles of 13.8-kilovolt supply lines and approximately 5 miles of supported control cable; and other work. Completion time 270 days. For particulars, address Bureau of Reclamation, P. O. Box 937, Boise, Idaho; P. O. Box 0219, East Wenatchee, Washington; or Building 54, Denver Federal Center, Denver, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5500) will be received at Ogden, Utah, until 10 a.m., Mountain Standard Time, March 16, 1961, for furnishing labor and materials for Earthwork and Structures, Willard Canal, Sta. 1+86 to Sta. 430+00, Weber Basin Project, Utah. Location near Ogden, Utah. Principal items are 1,087,000 cu. yds. of excavation; 381,500 cu. yds. of earth lining in canal; 3,600 cu. yds. concrete in structures; radial gate and slide gates; and other work. Completion time 700 days. For particulars, address Bureau of Reclamation, P. O. Box 387, Ogden, Utah; P. O. Box 360, Salt Lake City, 10, Utah; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5494) will be received at Page, Arizona, until 3 p.m., Mountain Standard Time, March 21, 1961, for furnishing labor and materials for Constructing Foundations and Furnishing and Erecting Steel Towers for Glen Canyon-Four Corners 230-Kilovolt Transmission Line, Transmission Division, Arizona-New Mexico, Colorado River Storage Project. Location Coconino, Navajo, and Apache Counties, Arizona and San Juan County, New Mexico. Principal items are 6,820 cu. yds. Excavation; 3,000 cu. yds. Concrete; 10,522,000 lbs. Furnishing structural steel; 758 Towers, Erecting 50 to 80-foot steel towers of various types complete with required leg extensions; and other work. Completion time 860 days. For particulars, address Bureau of Reclamation, P. O. Box 360, Salt Lake City 10, Utah; P. O. Box 277, Page, Arizona; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-5501) Set Aside For Small Business, will be received at Denver, Colorado, until 2 p.m., Mountain Standard Time, March 14, 1961, for furnishing three (3) 8.27-foot by 15.82-foot fixed-wheel gate frames and anchorages for Flaming Gorge Dam, Colorado River Storage Project, Utah-Wyoming. Delivery is desired within 210 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

OFFICIAL PROPOSALS

District of Columbia—Building Construction—Dept. of Bldgs. & Grounds, D. C., Feb. 3, 1961. CONVERSION OF OLD PSYCHIATRIC BUILDING, D. C. GENERAL HOSPITAL, 19th and "C" Sts. S.E., Wash., D. C. (Invitation No. C-6181-B). (Wage rates have been predetermined by Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Rm. 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $100.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, March 16, 1961, in Rm. 424, 499 Pa. Ave., N.W.

Many contractors depend entirely upon the

OFFICIAL PROPOSAL COLUMNS

of

Engineering News-Record

for Opportunities to bid.
They might not see your announcements if printed elsewhere

You undoubtedly want their bids on your contracts.
Make sure of them on your next contract.

The cost is only $2.70 a line per issue.

EMPLOYMENT NATIONAL COVERAGE OPPORTUNITIES

DISPLAYED RATE

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An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

MARCH 22ND ISSUE CLOSES FEBRUARY 20TH

UNDISPLAYED RATE

$2.70 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36

Electrical Engineers and Designers

Several openings available for electrical engineers and designers experienced in powerplant (preferably hydro) design. Salary commensurate with experience. Please send complete resume to Personnel Manager

HARZA ENGINEERING COMPANY
400 West Madison Street Chicago 6, Illinois

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

• POSITIONS VACANT

Construction Supervision. Construction engineer for inspection and supervisory work on electric power lines and substations. Opportunity for permanent employment and advancement with well-known consulting engineering firm. Send resume to P-6005, Engineering News-Record.

Engineer-Director of Specifications Department. Large Midwest consulting firm has immediate opening for capable man with broad experience in specification writing for all branches of building construction work. Must also possess administrative ability. Moving expenses paid. Send complete resume of educational background and experience, including personal qualifications to P-6053, Engineering News-Record.

Wanted Superintendent or Assistant Superintendent for hydraulic dredging firm in midwest. Experience on State and Corps of Engineer contracts preferred. Excellent opportunity for right man. State experience and references. All replies confidential. P-6067, Engineering News-Record.

Engineer—Estimator—Experienced in plant, mill and highway bridge construction. Location — Jacksonville, Florida. Send complete resume with anticipated salary to: P-5806, Engineering News-Record.

Electrical Engineer familiar with electric power systems. Permanent employment with opportunity for advancement in long-established consulting engineering firm. Write or call Stanley Engineering Company, Muscatine, Iowa.

Estimator—General Superintendent—Experienced sewerage and waterworks construction. Engineering background desirable. Medium size contractor specializing all phases this type construction. Midwest location. Send complete resume. P-5970, Engineering News-Record.

Superintendent for roads, streets, bridges, levees, sewers, etc. in the Midwest within 100 miles of St. Louis. Give resume of Experience, references, age, marital status and salary expected. Engineering degree desirable but not essential. The right man could go far in this organization. P-6014, Engineering News-Record.

Senior Cost Engineer. Must be familiar with the Uniform System of Accounts for Electric Utilities. Duties will consist of analyzing completed major construction projects for an Electric Utility. Experience with the Federal Power Commission or a State Public Service Commission would be desirable. Some experience with the Property Record Department of any Electric Utility would also be an asset. Please send complete information on experience, references, salary requirements, and availability. Indianapolis Power & Light Co., 25 Monument Circle, Indianapolis 6, Indiana, Employment Division.

(Continued on the following page)

ENGINEERS DESIGNERS

McKee offers permanent career opportunities to individuals qualified by experience to undertake the design of:

Steel Plants	Refineries
Sintering Plants	Chemical Plants
Pelletizing Plants	Petro-Chem Plants

Remuneration commensurate with experience and ability.

Reply in confidence to:

G. VICTOR HOPKINS

Arthur G. McKee & Company

2300 Chester Ave. Cleveland 1, Ohio

SALES ENGINEERS

A major steel company has need for sales engineers to promote and sell fabricated products in Middle Atlantic States. Excellent opportunities for men 25 to 30 years old with engineering background and a desire for sales work. Attractive salary with company car, expenses and bonus plan.

SW-6033—Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

CHIEF DRAFTSMAN

Large fabricator of structural steel for buildings, bridges, dams, locks, etc., located in deep south, seriously looking for qualified Chief Draftsman.

Must assume complete responsibility for operation of drafting room of over fifteen men. Prefer Civil Engineer with at least ten years' experience in structural detailing, capable of commanding the co-operation of his men and obtaining the highest quality of workmanship.

We are seeking a highly trained man with executive capacity, and expect to pay the right salary for the right man.

In reply give full experience record and educational background, stating age, marital status and salary expected.

P-6037, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

CIVIL ENGINEERS

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Poehler, Robert 124
SD Plants Inc. 123
Smith Inc., L. B. 125, 126
Stanhope Inc., R. C. 126
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Western Services Corp. 126
West Palm Beach, City of 123
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Whisler Steel Piling Co. 126
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Allis-Chalmers 101
Allison Div., General Motors Corp. 93
Alsynite, Div. of Reichhold Chemicals, Inc. 50-51
American Institute of Steel Construction 96
American Manganese Steel Div., American Brake Shoe Co. 86-87
American Pipe and Construction Co. ..... 3rd Cov.
American Sisalkraft Corp. 56
Arkwright Finishing Division 92
Armco Drainage & Metal Products, Inc. 54-55

Barco Manufacturing Company 82
The J. B. Beaird Co., Inc., A Subsidiary of American Machine & Foundry Company 107
Bethlehem Steel Co. 81
A. M. Byers Company 76-77

Caterpillar Tractor Co. 65-68
Caterpillar Tractor Co., Engine Div. 110
The Cerand Corporation 40
Chicago Bridge & Iron Company ..... 2nd Cov.
The Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div. 61
Concrete Reinforcing Steel Institute 71, 91
Connors Steel Division, H. K. Porter Co., Inc. 39

Dodge Division, Chrysler Corp. 102-103
Richard Dudgeon Inc. 90

Elgood Concrete Forms, Corp. 90
Ellicott Machine Corporation 74

Fireman's Fund Insurance Company 90
Ford Motor Company, Ford Div. 12-15

Goodall Rubber Company 29
The Goodyear Tire & Rubber Co., Industrial Products Div. 42-43

Hose-McCann Telephone Co., Inc. 60

International Business Machines Corp. 33
International Harvester Co. (Motor Trucks) 114-115

Johns-Manville Corp. 62-63

The Kinnear Mfg. Co. 71

Laclede Steel Company 70
Lead Industires Assn. 18
LeTourneau-Westinghouse Co. 75
Liberty Mutual Insurance Company 20
Lone Star Cement Corp. 84

Mack Trucks, Inc. 41
Macwhyte Company 97
Marietta Concrete Division, American-Marietta Co. 58
Marion Power Shovel Co. 49
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McGraw-Hill Book Co., Inc. 131
Moretrench Corporation 16
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National Clay Pipe Manufacturers, Inc. 105
Naylor Pipe Company 118
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Northwest Engineering Co. 3

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Sprague & Henwood, Inc. 104
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Tube Turns Division of Chemetron Corp. 8-9

Union Wire Rope Corp. 108-109
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Yeomans Brothers Co. 85

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Professional Services 127-130

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Notices
Proposals 120-123
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Advertisers' Index 130

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Editorials

Biggest Hydro

THE NEW NIAGARA POWER PROJECT produced first power last week and began edging its way into the top spot of a long list of U.S. hydro plants that have ranked in turn as the country's biggest—and in some cases as the world's biggest. When completed in 1963, the new project will have an installed capacity of 2.19 million kw, narrowly exceeding Grand Coulee's 19-year-old mark of 1.97 million kw. But we are nearly out of sites for such giants.

The immediate future of bigger hydro plants lies in Russia, where Kuibyshev has a capacity of 2.3 million kw; Stalingrad, nearly finished, 2.5 million kw; and Bratsk and Krasnoyarsk, under construction, 3.6 million kw and 4 million kw, respectively.

Then maybe the time will be ripe for Alaska's Rampart Canyon, 5 million kw. Or the Congo's Inga Falls, 25 million kw. Or even Tibet's Brahmaputra River, where there is a site for 30 million kw.

For those who like the challenge of the biggest, Niagara is not the last of the hydro giants.

Wise and Just Decision

THE CONGRESSIONAL DEBATE over President Kennedy's appointment of Robert C. Weaver to the post of Housing and Home Finance Administrator (see p. 25) ended the way it should—with approval of the appointment. Mr. Weaver is without question an expert in housing matters. Academically and professionally, he is as well prepared for this important post as anyone in the country. During a distinguished career of public service that began in 1933, he has dealt with housing problems on all levels of government. And most recently as vice chairman of New York City's Housing and Redevelopment Board he has demonstrated administrative ability of a high order.

The decision to approve Mr. Weaver was therefore a wise one. It was, moreover, just, for denial of approval could only have stemmed from the fact that Mr. Weaver is a Negro.

How much of the anti-Weaver sentiment within Congress and within portions of the housing industry was due to racial bias and how much to the fact that Mr. Weaver has been an outspoken opponent of segregated housing cannot be determined. In any event, neither of these reasons can be justified on either moral or legal grounds. And if economic disadvantages do develop in some areas as a result of integrated housing requirements, they will have to be accepted, as indeed they should be, on the basis of the principle of equality regardless of race, creed or color.

Any administrator of the Housing and Home Finance Agency would have to deal with this problem as with a multitude of others. Mr. Weaver, being a Negro, and noted for fairness and demonstrated good sense, may well handle the problem better than anyone else could. His was a good appointment, and Congress acted wisely and justly in approving it.

Model Plan on the Delaware

THE MOVE FOR interstate development of the Delaware River Basin's water resources has come full circle. A proposed four-state compact is again before Congress and the legislatures of Delaware, New Jersey, New York and Pennsylvania.

But this time things are different. The federal government is a full partner, and the emphasis has shifted from water supply to flood control.

There is not the same urgency for joint action that existed in 1950-53, when the abortive Incodel Plan was being debated. New York City, Philadelphia and northern New Jersey have since gone their independent ways to solve water supply problems. Still there are great benefits to be derived from cooperative development, particularly by Pennsylvania, New Jersey and Delaware.

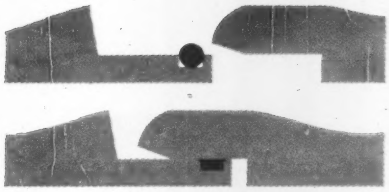
If approved, the compact will create an agency without precedent in water resources development. There are other interstate compacts for carrying out fact-finding, advisory and regulatory functions. But besides these responsibilities, the Delaware River Basin Commission would have the authority to finance, build and operate dams, reservoirs, powerhouses and other facilities necessary for its purposes. There are other basin development agencies with responsibilities for construction, finance and operation, but none of them is interstate.

A primary responsibility of the new commission will be to adopt or prepare a comprehensive development plan for the basin's water resources. In this respect, it will be following the lead of one of the Texas basin agencies, the Trinity River Authority. The TRA came up two years ago with the first locally sponsored and privately financed (by the Trinity Improvement Association) comprehensive river basin plan in the country (ENR Sept. 4, 1958, p. 26). The Delaware plan, though not privately financed, is on a grander scale and affects a much heavier concentration of people and industry.

The Delaware commission will be spared one task the Trinity River Authority had to face—preparation of a plan almost from scratch. A fairly inclusive plan for the basin has been in preparation by the Corps of Engineers' Philadelphia District for over three years. Major features outlined in a preliminary release last spring (ENR Apr. 7, 1960, p. 23) would go a long way toward meeting the basin's flood control, navigation, water supply and pollution control needs.

The Delaware River Basin Commission might well become, as New York's Gov. Nelson Rockefeller declared, "something that will serve us all well and be a model set-up for other river systems."

LONG-TERM ECONOMY



DEPENDABLE PIPELINE CLOSURE

A pipeline is only as strong as its joints. In addition to water pressure, American Concrete Cylinder Pipe joints will withstand the forces of expansion and contraction, sudden live loads, traffic vibration, earth settlement and many other forces which act upon a pipeline. ■ Steel joint rings, sized to carefully controlled tolerances, confine an "O" ring rubber gasket by compressing it on three sides in an annular groove in the spigot ring and on the fourth side by the bell ring. The design is such that the gasket, sized to the precise volume required, maintains a positive water-tight seal even while permitting a considerable degree of flexure at the joint. ■ The ease of installation and the reliability obtained through the use of this proved joint are additional reasons why American Concrete Cylinder Pipe means long term economy to the pipeline owner. See an American sales engineer when planning your next project.

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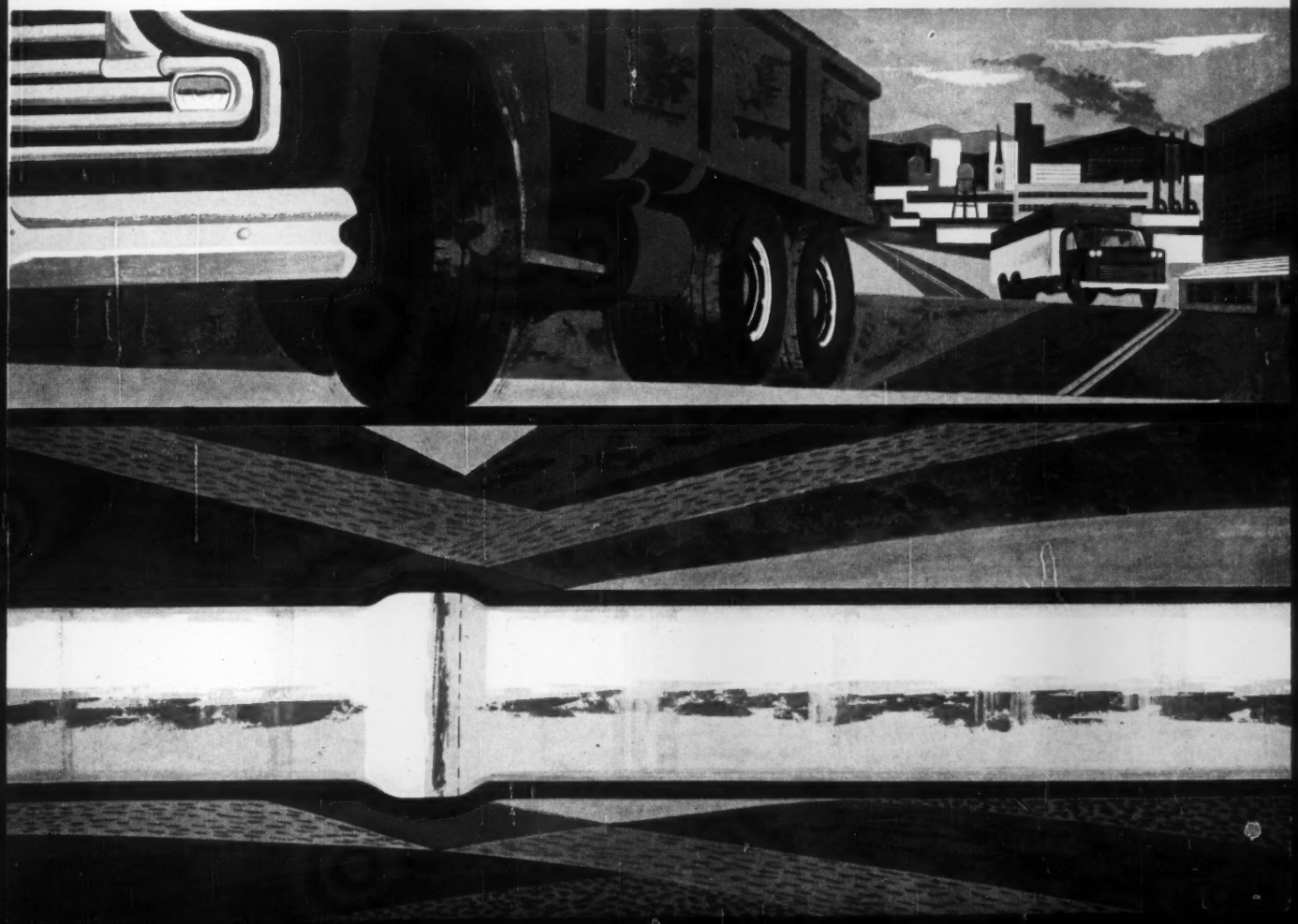
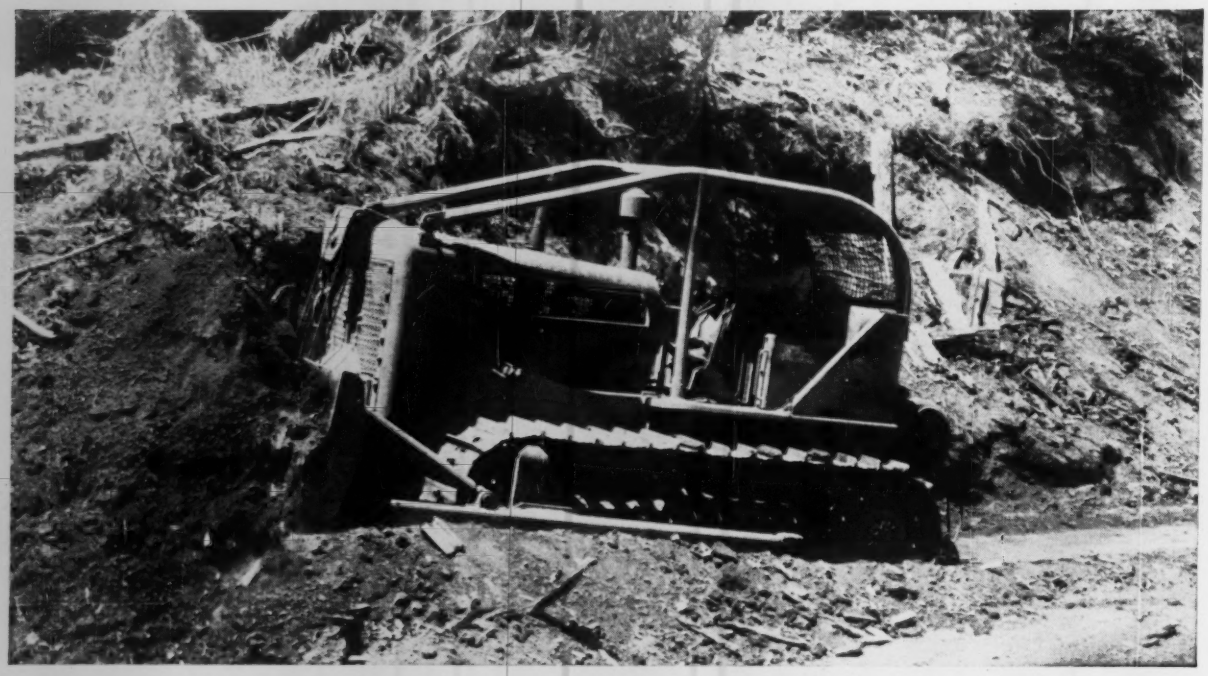


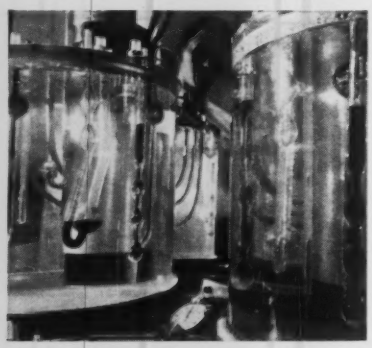
How Allis-Chalmers puts horsepower where it's needed—cuts contractors' costs



By keeping friction to a minimum in all moving parts of their compact HD-16, Allis-Chalmers engineers produced a machine that works right along side higher rated crawlers. The HD-16 heavy-duty model has 58 Timken® tapered roller bearings to practically eliminate friction in bevel gear and clutch shaft, final drive pinion, intermediate and sprocket shafts, track idlers, support rollers and truck wheels. The result is that more of its 148 horsepower is delivered to the tracks *— where it counts.*

By making the most of the available horsepower, with Timken bearings to roll the loads, Allis-Chalmers gives contractors more *work power*—enables them to use a compact, less expensive machine for the job, increase their profits.

BEARING ENGINEERING ASSISTANCE, early in the design stage, helps manufacturers stretch bearing dollars. Timken bearing sales engineers have the training and are eager to help you with on-the-spot engineering service.



METALLURGICAL LAB develops the steels that will make tomorrow's Timken bearings last even longer, helps customers design more economically.

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